

COMPUTERWORLD

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NCC '85: Big crowds, little action

By Kathleen Sullivan
CW West Coast Bureau

CHICAGO — Although the 1985 National Computer Conference here attracted 8,000 more attendees than last year's show, it will leave behind an otherwise undistinguished record. Since few companies chose this city as the backdrop for product introductions, the show lacked the excitement of previous NCCs.

When asked to comment on their impressions of NCC '85, visitors interviewed by *Computerworld* gave the show — both the exhibits and the technical seminars — mixed reviews. NCC lacked excitement, many said. Though some visitors gave the



A bird's-eye view of the NCC '85 show floor at McCormick Place

technical seminars high marks, others complained that the quality of the presentations was uneven.

Vendors registered a different set of complaints, centering on their dealings with the city's trade unions (see story page 6). Representatives from several firms told stories of mishandled equipment, damaged computer systems and abrasive contact with union members.

Yet a spokesman for the American Fed-

eration of Information Processing Societies, Inc., the prime sponsor of the show, said that, in his estimation, exhibitors were pleased overall with NCC '85. "The reaction to this year's NCC has been more positive than I've seen in years," said Donald G. Dowd, NCC '85 communications chairman.

Dowd said the show's increased attendance could be interpreted as an optimism. See NCC page 8

Wang to offer bridge to IBM?

By John Desmond
CW Staff

LOWELL, Mass. — Wang Laboratories, Inc. here has developed products that allow the IBM Personal Computer to run Wang Word Processing and the IBM Personal Computer to link to Wang VS minicomputers, according to Wang internal documents obtained by *Computerworld*.

Wang Word Processing for the IBM Personal Computer would include a Wang keyboard and software for a price of \$695.

See WANG page 4

Slump snares mainframe makers

By Peter Bartolik
and Clinton Wilder
CW Staff

Evidence of the continuing computer industry slump was in sharp focus last week as IBM and four of the five Bunch mainframe vendors reported second-quarter profit declines. Sperry Corp. was the three-month period's lone winner, posting a 23% earnings gain over its results from one year ago.

IBM reported that second-quarter profits were down almost 13% from the year-earlier quarter, as revenue growth continued at the dismal pace set in the first quarter. Results from the four other Bunch

companies showed that profits declined by 5.6% at Burroughs Corp.; 13% at NCR Corp.; 84% at Control Data Corp., with a \$24.9 million operating loss from computer sales; and 29% at Honeywell, Inc.

IBM's financial results for the first six months of the year reflected the dramatic downturn that has thrown the industry into turmoil following two years of overall record growth.

Although much of this year's financial adversity was attributed to the strength of the U.S. dollar abroad, IBM said it estimated that if currency rates had equaled those of the first half of 1984, the company's

See RESULTS page 4

Poll shows mini mart saturated

Sales drop-off attributed
to heavy 1984 purchases

By Tom Henkel
CW Staff

DELRAN, N.J. — For mini and super-minicomputer vendors wondering why their products have suffered a sales drop-off recently, the answer may rest in the heavy sales of the past year.

A recent survey conducted here by Datapro Research Corp. of 1,702 minicomputer users revealed that most of these users replaced an older system during the past 11 months. A Datapro survey of mainframe users [CW, July 15] turned up similar results. The mainframe users said the average age of their systems was less than 10 months.

By contrast, when surveyed by Datapro on the same question last year, minicom-

puter and mainframe users said their then-current systems averaged slightly more than 40 months old.

On the whole, the minicomputer users polled this year said they were more pleased with their systems now than they were last year. This conclusion is derived from Datapro's "overall satisfaction" category, a composite score based on several

factors, including ease of operation, reliability, vendor services and vendor-supplied

software. Most minicomputer vendors included in the 1985 Datapro survey showed a moderate improvement in overall user satisfaction. Some, like Harris Corp. and Honeywell, Inc., showed significant improvements.

Asked whether their systems fulfilled expectations, 85.9% of the mini users polled by Datapro said that they did. But as with the survey's overall satisfaction rating, most vendors' scores showed lit-

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TOP OF THE NEWS

The U.S. Navy is scrutinizing its computerized inventory control system following the arrests of five people charged with diverting stolen jet fighter parts to Iran. Page 2.

Net results. Apple lost \$17 million in the second quarter as its revenue plummeted nearly \$50 million from last year's figure. Page 4.

Communications standards are crucial to the future of networking, but NCC-goers view the short-term implications critically. Page 8.

Seek and ye shall not find. They're trying all sorts of ways to provide end-user access to mainframe data, but DP managers are finding there is no perfect solution. Page 10.

Can the Macintosh make it in the corporate world? Some NCC attendees think it might. Page 12.

NEWS

Stolen parts spur Navy probe

By Bryan Wilkins
CW Washington Bureau

WASHINGTON, D.C. — The U.S. Navy last week began conducting a head-to-toe investigation of its computerized inventory control system in the Naval Supply Systems Command, following the arrests of five individuals who were charged with diverting to Iran stolen weapons systems parts for F-14 aircraft.

U.S. Customs Service special agent John Hensley said last week, "We don't know how they did it. We were afraid during the investigation to push up inquiries into the [computerized inventory] system because we were afraid we would tip them off. We are really in the dark."

Meanwhile, the Naval Investigative Service was busy beginning a more thorough effort to establish the trail used by four Filipino nationals and an Iranian living in England. The Iranian allegedly stole the parts for F-14 aircraft and smuggled them to Iran in containers identifying them as medical supplies and auto parts.

The ring was broken by Federal Bureau of Investigation, Customs Service, Navy and U.S. Department of Justice investigators who were supposedly tipped off to its existence last fall during a routine audit of exports leaving the U.S.

Last week, Navy officials in Washington, D.C., were unavailable for comment on the security, level of personnel access and the architecture of the computerized inventory control system used by the Naval Supply Systems Command.

"We just don't want to comment on this until we are able to find out more about what happened on the [aircraft carrier *USS Kitty Hawk*] and in San Diego," a Navy spokesman said.

Meanwhile, Winston Kuehl, regional director of the Naval Investigative Service, shed some light on the difficulty that investigators faced trying to determine how the stolen-parts ring operated.

"It is logical to assume that since there is a highly computerized system in operation — the standard supply system for the Navy is computerized

— that they were using it in some fashion," Kuehl said.

He said the investigators accumulated a lot of information during the breakup of the ring that is still being pieced together.

No clue as to how parts were removed from system

"We have no certainty to conclude how the parts were getting out of the system. We don't know if they were ordering parts up on the system and then diverting them or just taking parts from existing inventory or as they came in," according to Kuehl.

Kuehl said the Navy "was not in the position to check its system inventory to see if parts were missing. We can't say whether or not the parts were listed as missing." He added that the existing inventory control system was not an integrated one but rather a system of collateral parts that served particular functions.

One of three San Diego residents arrested was a Navy enlisted man, Baluyat Cayabyab, 36, working on board the *Kitty Hawk*. A second was a civilian, Pedro Manansala Quito, 60, employed by the Navy at its Air Logistics center in San Diego where aircraft engines were reworked; a third, Franklin Pangilinan Agustin, 47, ran an insurance business.

The two others arrested were Edgardo Pangilinan Agustin, 45, of Jamaica, N.Y., brother of Franklin Agustin; and an unidentified Iranian national living in England. Court papers identified Saeid Asefi Inanlou, 36, of Middlesex, England, as communicating with the other four.

The stolen-parts smuggling ring was traced back to San Diego through Virginia, New York and London.

Navy officials said they have also traced stolen parts from the aircraft carriers *USS Carl Vinson* and *USS Ranger* and indicated there may be more persons involved in the ring.

"We think they were a bunch of thieves. Their motivation was money," said Quintin Villanueva, Customs Service regional commissioner.

"We don't know how they did it. . . . We were afraid we would tip them off. We are really in the dark."

— John Hensley
U.S. Customs Service

NEWS SUMMARY

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REPORTER'S NOTEBOOK

Ramblings from the floor of the 1985 National Computer Conference:

■ William Steele, Sytek, Inc.'s OEM Programs director, borrowed a page from political science to explain why he does not expect a major role for diskless personal computers on local-area networks.

Networked diskless micros will not fly if DP uses them in an attempt to return to a highly centralized computing environment, Steele said. In his view, users will no longer accept overly centralized computing plans, which share many defects with socialist centralized economic plans. "You have your five-year plans, which never work, and you have your annual crop failures," he explained.

■ IBM has changed its stripes — pinstripes, that is. It seems the company's attempt to shuck the image of being stodgy and bureaucratic was reflected in the attire of Big Blue's booth personnel. There was not a three-piece men's blue pinstripe suit or women's two-piece navy ensemble on any of the 20 or so booth attendants. In fact, light-colored suits with brightly colored ties, penny loafers (cordovan colored, no less) and open-toed women's shoes were the dress of the day. And the presentations at the booth, clearly one of the busiest on the floor, were lighter and breezier than we have seen at other shows. It makes us wonder what they did with all that pinstripe wool.

■ Televideo Systems, Inc. is expected to announce a laser printer in time for the Comdex/Fall '85 show, but the machine will not use the popular Canon USA engine. According to a Televideo source, "Canon has a very poor price-performance factor." Canon's engine has a frequency of repair problems, the source said, adding, "We are looking at several Japanese manufacturers of better laser engines."

■ At the press conference introduction of its new and enhanced Control:Manufacturing and Control:Financial applications, Cincom Systems, Inc. also announced that it intends to develop specific versions of those manufacturing/financial systems for the aerospace and defense industries. Cincom President Dennis Yablonsky said the targeted industries represent a massive marketplace that no vendor is adequately addressing.

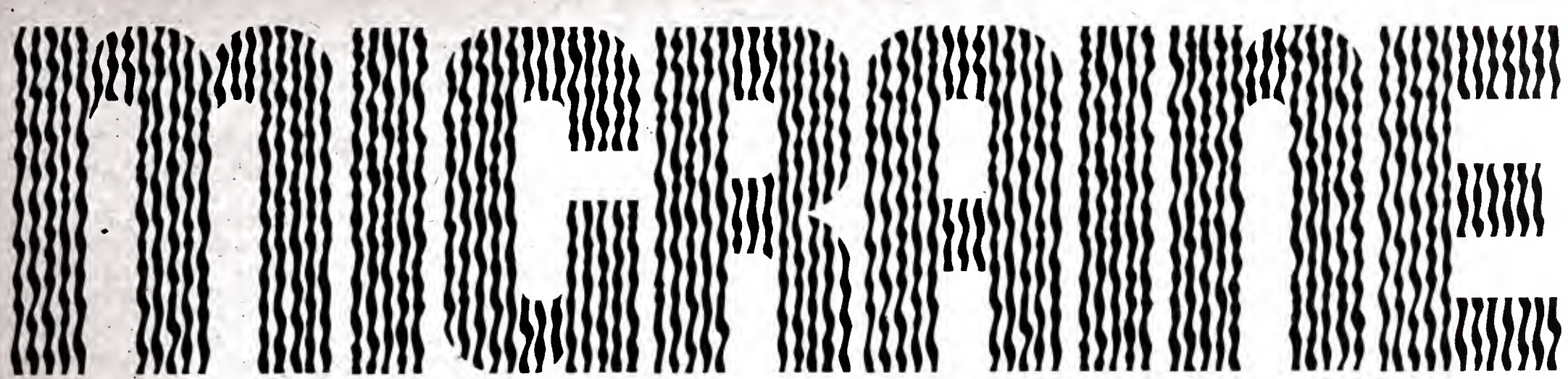
Cincom also said that, as a result of its recently penned joint marketing agreement with Digital Equipment Corp., it is currently at work on a VAX-compatible version of its Netmaster network control software.

The company also announced that it is developing general ledger and order entry packages for its Business Control System line and will likely be introducing them within the upcoming year.

■ Nonprofit organizations that got free countertop space from the American Federation of Information Processing Societies, Inc. (Afips) in past years were out of luck this year. Afips — reportedly annoyed that some of those countertops were left unattended and became messy — made it a rule that only Afips-affiliated organizations could have the countertops for free. The rest of the organizations had to purchase space — an option some of those organizations could not afford.

■ In the "best-laid-plans-go-awry" category, the 12-by-12-ft frog used by Charles River Data Systems, Inc. was not able to sit atop his customary pad this time. The giant amphibian would not clear the ceiling over the booth he usually sits on, so Afips gave him his own floor space this time around. This was the frog's second unseating, the first occurring in January of 1984 at the Federal Computer Convention in Washington, D.C. There, the frog was relegated to the lawn and got snowed on, according to one of his keepers in the booth.

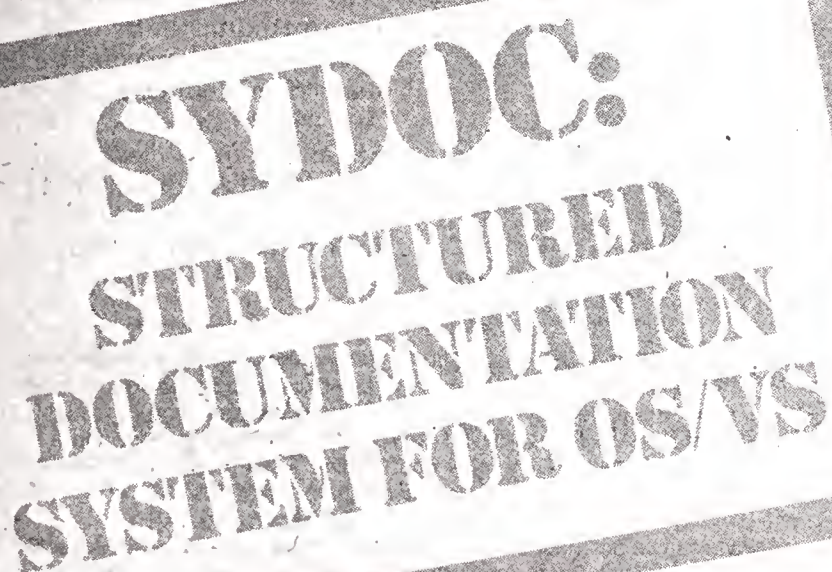
■ The burning man who demonstrates halon gas in the Fenwal, Inc. booth was accompanied again this year by magician Denny Rourke of Omaha. Rourke claimed to make about 50% of his earnings per year by working magic for trade show crowds.



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QUESTION: Which is a bigger headache? The COBOL-documentation problem or the high-cost-of-maintenance problem?

ANSWER: Both.

* * *

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NEWS

Apple cites reorganization costs in first losing quarter

By Clinton Wilder
CW Staff

CUPERTINO, Calif. — Apple Computer, Inc.'s recent layoffs and consolidation moves struck the bottom line last week as the microcomputer vendor reported a \$17.2 million loss in the third quarter ended June 30. The results reflected by far the worst period in Apple's 8½-year history, and it was the company's first losing quarter since it went public in 1980.

Apple attributed the 28-cent-per-share loss to a \$40.3 million expense from its dramatic reorganization, plant closings and four-figure layoffs during the quarter. One year ago, the company earned profits of \$18.3 million, or 30 cents per share.

Apple's revenue of \$374.9 million for the three months represented an 11% drop from the year-earlier quarter and a 14% decline from the first quarter of 1985. The company said it had modest operating profits before taxes of \$3.5 million, compared with

\$28.3 million one year ago. A tax write-off of \$16.5 million helped cushion the reorganization and consolidation costs.

Apple President and Chief Executive Officer John Sculley said the firm has successfully lowered its break-even point and increased its cash reserve by 31% to \$254.6 million during the quarter. "While it's difficult to predict how long the pause in the computer industry will last, we are confident that Apple is positioned to take advantage of future growth," he said.

Lloyd Cohen, an analyst at International Data Corp. of Framingham, Mass., attributed Apple's loss to its failure to crack the business market with the Macintosh. "Having [Lotus Development Corp.'s] Jazz come out as late as it did caused a severe impact on [its] earnings," he said. "No matter what they say, unless you can get into the business market, you can't survive in the long run."

WANG from page 1

Wang Office Connection, priced at \$1,200, would offer a Wang Systems Networking (WSN) card and WSN software, in addition to Wang WP for the IBM Personal Computer.

Internal debate caused delays?

A Wang spokesman made no comment on the products and would neither confirm nor deny that they exist. A spokesman for a Wang user magazine said internal debates are delaying the products since they represent a change in Wang's strategy of competing head-to-head with IBM, rather than marketing IBM-compatible products.

Wang WP for the IBM Personal Computer would provide users with a modified version of the Wang WP Version 2.5, including such functions as glossary, math, merge/print, sort and a spelling verifier with a 66,000-word vocabulary. The product would provide the IBM Personal Computer and Wang Professional Computer with compatible disk formats. Wang software would not work on IBM Personal Computers without Wang's modified version of the universal keyboard, the documents indicated.

Wang Office Connection with the WNS card and software would allow users to link IBM Personal Computers to a Wang VS for file transfer and remote login. To a VS, the IBM Personal Computer would look like a remote Wang 2256/C VS/DP workstation.

'Strategically shifting gears'

Wang previously announced the WSN card option for the IBM Personal Computer in 1984 for a price of \$1,850 [CW, June 18], but a Wang spokesman said the product was never delivered. "Strategically, we are shifting gears" on the WSN card, the spokesman said, adding, "To talk about that strategy would be premature." The Wang user magazine spokesman suggested that the Wang Office Connection product is a competitively priced enhanced WSN card for the IBM Personal Computer, bundled with the Wang WP software and keyboard.

The WSN card would fit into any expansion slot on the IBM Personal Computer and would run either point-to-point or multipoint communications. It would support transmission speeds of 1,200 bit/sec. to 9.6K bit/sec. The VS would have to be equipped with appropriate VS software, communications controller hardware and Version 6.2 or greater of the VS operating system, the documents indicated.

The two communications services offered by Wang Office Connection would be VS Remote Logon and Bidirectional File Transfer. VS Remote Logon would provide the VS with DP capabilities, including access to Wang Office, the company's series of office automation applications.

The Bidirectional File Transfer product would allow binary file transfer between the IBM Personal Computer and the Wang VS. IBM PC-DOS files could be sent to the VS for storage, and VS print files could be sent to the IBM Personal Computer for printing. Documents created on the IBM Personal Computer with Wang Word Processing could be transferred to a VS.

Both packages would work on an IBM Personal Computer with two diskette drives or on an IBM Personal Computer XT with one disk drive and a hard disk. A minimum of 256K bytes of memory and PC-DOS 2 or higher would be required. The products would support monochrome and color monitors.

Products not supported by the Wang products would be the IBM Personal Computer AT, 3270 Personal Computer, PCjr and all IBM compatibles.

According to Vincent Flanders, associate editor of *Online Data Access*, a magazine for Wang users based in Austin, Texas, internal bickering at Wang is continuing about whether or not to announce the products, even though the company is geared up to produce them. "Some people are questioning it because they're afraid it'll cut into sales of their own [Professional Computer] and Wang Office Assistant," the company's low-cost word processor, he said.

RESULTS from page 1

profits would still have declined by more than 7%. The six-month profits of \$2.4 billion, or \$3.91 per share, were off 15% from the \$2.82 billion, or \$4.62 per share, reported in the first half of 1984.

Second-quarter profits were \$1.41 billion, or \$2.30 per share, compared with year-earlier profits of \$1.62 billion, or \$2.65 per share. Revenue for the quarter was \$11.43 billion, up 2.1% from \$11.2 billion a year ago. For the six-month period, revenue increased only 2% to \$21.2 billion from the first six months of 1984.

IBM President John F. Akers said the company is pleased with orders for its 3090 mainframe, and it has been able to push up shipments into the third quarter for a number of customers.

At NCR, second-quarter profits were \$66.6 million, or 67 cents per share, down 13% from \$76.2 million, or 73 cents per share, a year earlier. Per-share profits were down only 8% because of the company's stock repurchase programs. Revenue for the quarter was \$1.03 billion, up 3% from \$998.8 million a year earlier.

Honeywell's second-quarter profits indicated a rapid reversal of its first-quarter results, when the company went against the grain of the spreading industry slump with a 16% profit increase on revenue that increased by 7.5%.

In the second quarter, revenue was \$1.55 billion, a 5.3% increase over \$1.47 billion in the year-earlier quarter. Profits for the quarter ended June 30 were \$52.5 million, or \$1.14 per share, compared with \$74.3 million, or \$1.59 per share, a year earlier.

Honeywell said operating profits were below year-earlier levels in three of its divisions, and the fourth division, aerospace and defense, was even with the pace of a year ago.

Sperry went against the tide of adverse mainframe company financial results, reporting that computer sales offset declines in other areas to push first-quarter profits to \$51.5 million, or 91 cents per share. Those results were up 23% over year-earlier profits, excluding the write-down of its investment in Trilogy Ltd.

Sperry's first-quarter profits were actually up 156% from an unusually low quarter one year earlier, when it posted profits of \$20.1 million, or 37 cents per share. Without the write-down of the Trilogy investment,

profits for the earlier quarter would have been \$41.9 million, or 77 cents per share.

The company's revenue for the quarter just ended was \$1.42 billion, up 20% from \$1.87 billion a year earlier. However, these results were in comparison to a very low quarter. In the preceding two quarters, Sperry reported revenue of \$1.45 billion for the third quarter of fiscal year 1985 and \$1.79 billion for the fourth quarter; profits were \$61.2 million and \$105.9 million, respectively.

Gerald G. Probst, chairman and chief executive officer of Sperry, said the company's commercial computer business experienced continued strong performance, while the defense and aerospace and farm equipment businesses were below plan.

Burroughs' revenue posted a scant 1.1% gain from \$1.21 billion a year ago to \$1.23 billion in the last quarter. Burroughs Chairman W. Michael Blumenthal called the results "somewhat better than expected," considering the industry slowdown.

Profits of the Detroit-based company dipped 5.6% from \$57.3 million in the year-earlier quarter to \$54.1 million. Per-share earnings fell 7 cents from \$1.26 to \$1.19 per share.

CDC said profits plummeted from \$23.4 million, or 60 cents per share, in the like quarter in 1984, to \$3.8 million, or 10 cents per share. CDC revenue remained flat at \$1.26 billion.

The Minneapolis firm said it lost \$29.4 million in its computer sales before an extraordinary gain of \$13 million from the sale of its on-line financial transaction service and other assets. CDC's losses were cushioned by a successful quarter for its financial services unit, Commercial Credit Co.

Also last week, AT&T reported that second-quarter revenue, after the deduction of access charges paid to local telephone companies, declined slightly from the year-earlier level. Profits for the quarter were up just more than 1%, although year-earlier profits were inflated by access costs that did not show up until the third quarter of 1984.

AT&T said second-quarter revenue, after deducting access charges, was \$8.55 billion, down slightly from \$8.58 billion a year earlier. Profits were \$461 million, or 41 cents per share, compared with year-earlier profits of \$455 million, or 43 cents per share.

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NEWS

NCC '85 exhibitor turnout mirrors industry downturn

By Paul Korzenlowski
CW Staff

CHICAGO — Just as a number of hardware and software vendors are doing, the National Computer Conference (NCC) tightened its belt this year.

"The computer industry is in a cyclic phase of consolidation," noted Arnold Smith, chairman of the NCC committee, in an interview at last week's conference.

A by-product of the consolidation is that approximately 100 fewer companies exhibited at this year's show than at last year's show. The number of exhibitors this year is similar to 1981 and 1982 levels — significantly less than those for 1983 and 1984.

Some large companies like Digital Equipment Corp. and Wang Laboratories, Inc. did not attend this year's show. Smith claimed that their absence will not affect future shows. "Attendees come to see products from a number of companies — not from just one vendor," he claimed.

Despite this year's downturn, Smith predicted that the number of exhibitors at next year's show will increase by at least 10%. "My gut feeling, which comes from predictions by companies like IBM, is that the industry will pick up at the beginning of next year," the chairman forecast.

An upturn may prompt the return of traditional participants. "We have been in contact with companies that

dropped out of NCC this year, and none have ruled out the possibility of returning next year," Smith said. "Most were faced with financial problems this year." The chairman claimed that this year more than

180 companies representing a broad range of industries were participating at NCC for the first time.

Smith ruled out a number of reasons for the decrease in the number

”

'My gut feeling . . . is that the industry will pick up at the beginning of next year.'

— Arnold Smith
NCC committee

cause they can schedule their vacations and bring their families with them to the show."

Despite Smith's assertion, the American Federation of Information

Processing Societies, Inc. is attempting to schedule the conference so it will be held in early June. Through 1990, the show will alternate between Las Vegas and Chicago sites. "Convention centers such as [Anaheim, Calif.] and New York are too small to hold the conference," the chairman noted.

All of the Las Vegas shows are scheduled for early June, according to Smith. The 1987 Chicago show is also slated for June, but other Chicago shows are scheduled for July. "We are trying to reschedule all the July Chicago shows," he said. "We would like to move them to May, but we have a better chance of having them moved to sometime in June."

ITT announces applications processor units

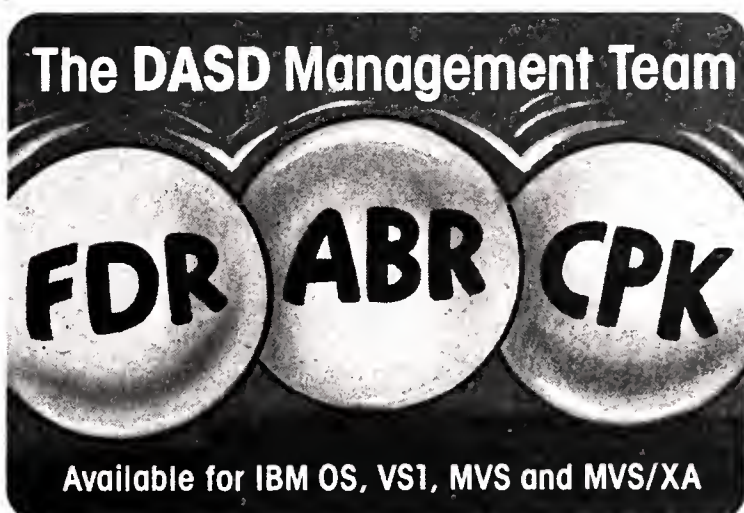
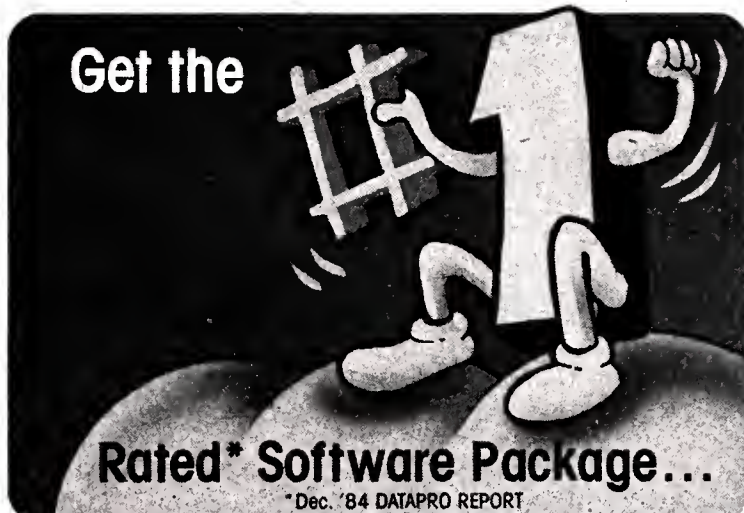
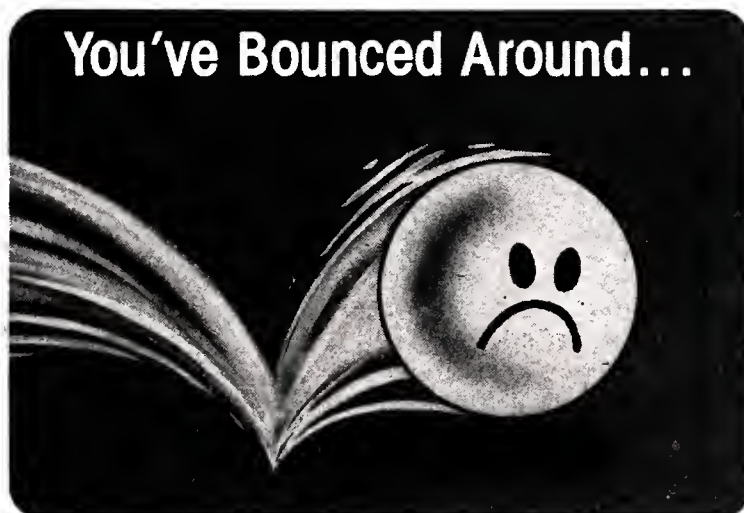
CHICAGO — ITT has introduced an applications processor aimed at providing local processing capabilities to users of IBM 3270 workstations or voice/data private branch exchanges.

Two models of the unit were announced here. The Model I, which includes a 20M-byte fixed media disk drive, costs \$18,500. The Model II includes one 60M-byte fixed media disk drive and one 60M-byte tape subsystem. It costs \$24,000.

Both models come with Microsoft Corp.'s Xenix operating system, a 1.2M-byte floppy disk drive, one Centronics Data Computer Corp.-compatible parallel printer port, one RS-232C asynchronous terminal port and one device adapter that will support eight coaxial cable-attached devices. The unit reportedly accommodates from 1M to 13M bytes of main memory.

The applications processor is said to give users of the firm's 9200 series display stations the option of either communicating on-line with an IBM 3270 or using the local processing power of the applications processor. Programmers' code can compile and run programs locally, without having to access the host processor. Once a program is complete, it can be uploaded to the host, the company said.

ITT is located at 1515 W. 14th St., Tempe, Ariz. 85281.



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NEWS

NCC exhibitors frustrated by union setup hassles

By Charles Babcock
CW New York Bureau

CHICAGO — National Computer Conference (NCC) exhibitors said Chicago is their kind of town for a trade show, but many said they have come to loathe dealing with the trade unions that dominate the city's McCormick Place.

Some said they are thinking about not coming back.

"You have to have these big, hulking people, who don't know anything about electronics, moving things around," said an irritated exhibit manager for a large laser printer firm, referring to the Teamsters union riggers.

"A forklift operator dropped our Astra 300 minicomputer, which we needed to run half our exhibit, and ruined it," said Laurel Dutcher, show coordinator for NEC Information Systems, Inc. Because the machines are custom-made, NEC had no backup model in the U.S. and had to assemble another in Japan quickly.

The wood panels that frame the Britton-Lee, Inc. display were gouged in several places during installation, and five minutes before the show opened, an improperly installed fuse cap blew, robbing Britton-Lee's exhibit of power, according to David L. Britton, the firm's president.

A forklift operator carrying *Computerworld's* 14 Digital Equipment Corp. Rainbows "drove into a wall," tumbling the micros from the top of the load and breaking two of them, the newspaper's Operations Manager Jeff Pennett said. Some of those that work have parts rattling around inside them, he said.

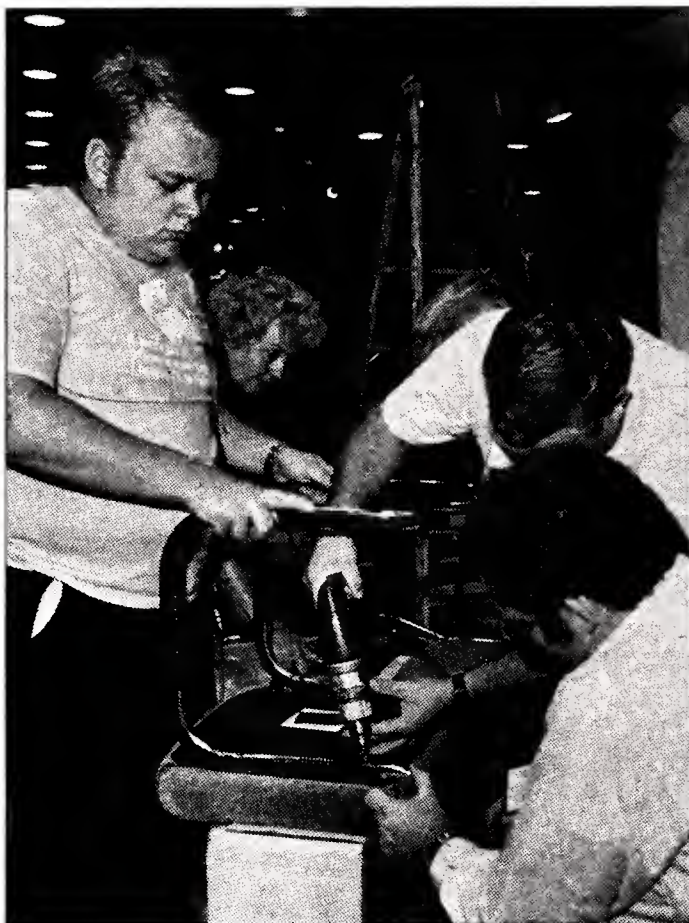
Mishaps at trade shows not uncommon

Stories about freight mishaps are not uncommon at a major trade show, and exhibitors arrived knowing that all work was supposed to be done by \$23.50-per-hour riggers, \$34.25-per-hour carpenters and other skilled laborers.

But many complained that the work was done more poorly than during NCC's previous visit to Chicago two years ago, and union representatives were abrasive about following work-expanding contracts.

"This little guy with a yellow pad went around telling everybody [that] you need a union man to do anything," said Judy A. Diaz, marketing manager for Oracle Corp.

"We couldn't plug in our own machines," complained one exhibitor, and another said three electricians spent hours studying his complicated audiovisual system before accepting the exhibitor's guidance on how to connect the wires. The Charles River Data Systems, Inc. exhibit in Ray Schoessling Hall was charged \$50 to plug in its inflatable



Three union workers assemble one chair.

frog.

Joseph Hannon, president of the Chicago Convention and Tourism Bureau and managing director of McCormick Place, referred the exhibitors' complaints to aides. Those aides referred questions to Rick Dobson, exhibition manager for the American Federation of Information Processing Societies, Inc., who was unavailable for comment before press time.

"They really take their time, kibitzing and everything," said Oracle's Diaz about the union laborers at McCormick Place. "We asked them why they couldn't speed up, and they said, 'Why hurry? Your company just writes off the expense.' I feel like I'm being robbed from both pockets," she said.

At a printer exhibit, carpenters assembled wooden steps with translucent covers while electricians stood by to screw in the light bulbs, said the exhibit coordinator.

Exhibitors were frequently reluctant to talk about their problems with the trade unions. "I don't want to get into that," said IBM's Exhibit Manager Jeff Malley, as he looked askance.

Many exhibitors needed the services of trade unions during the show, and all of them had to live with the trade union representatives until their

exhibits were dismantled last Thursday night.

According to Diaz, word went around Schoessling Hall Friday that a small exhibitor who had complained too much about the slow pace of work had suddenly lost power at his site.

"Can you imagine being at a computer show and not having any power?" Diaz asked.

Many exhibitors expected their bills to be the highest they will have ever paid for a trade show. Exhibitors were already paying \$21 per square foot for McCormick Place space, one of the highest rates in the country. The recent PC Expo at the Coliseum in New York charged exhibitors \$20 per square foot, and rates in other cities are typically \$10 to \$11 per square foot, exhibitors said.

Many said work that should have been done prior to the show was not finished by the Friday before the show. So exhibitors paid time and a half on Saturday to get it finished.

The aggressive union attitude and frustration over delays prompted many exhibitors to skirt rules they had come to Chicago planning to honor. D. Michael Hunter, marketing technical administrator for Dotronix, Inc., said he lost power at his site four times during the show, with electricians making lengthy searches for the cause each time.

After the fourth time, he rolled up the carpet himself and found an improperly installed junction box, which he fixed, solving the problem, he said.

The staff of Panasonic Co. requested riggers at 8 a.m. Friday, and when they had not arrived by 3 p.m. Saturday, they went ahead and set up their exhibit themselves. "We informed the management of McCormick Place what we were doing. They were quite understanding," the Panasonic coordinator said.

Paying \$914 for table covers

CW staff members balked at paying the \$914 quoted by United Exposition Service Co., a company contacted by the show's sponsor for NCC, to have table covers spread on 12 worktables. Instead they bought \$47 worth of plastic tablecloths at Woolworth's, covering the tables themselves.

A high-speed printer company spokesman with a 40- by 50-foot exhibit space said he spent \$600 to \$700 to have his carpet vacuumed during the four days of NCC. He said he was not allowed to bring his own vacuum cleaner, and the charge is an example of why his company is cutting back on its NCC exhibit next year.

"We've decided to go from 2,000 feet to 900 feet. You could call it purely a business decision, but it's enhanced by the fact [that] we don't like the union hassles here," he said.

"A lot of people are going to think twice about coming back," Diaz said.

AI expert systems: Increase in practical applications

Uses range from blood types to interest rates

By Kathleen Sullivan
CW West Coast Bureau

CHICAGO — Within the field of artificial intelligence, expert systems are attracting attention. In an effort to demonstrate some of the practical applications of these systems, a group of panelists presented snapshot views of current projects during a session at last week's National Computer Conference here.

Harvey P. Newquist, editor of "AI Trends," a newsletter published by DM Data, Inc., a Scottsdale, Ariz.-based market research firm, said Shearson Lehman/American Express, Inc. is using an expert system to perform interest rate swapping at its offices in New York.

The system, which was installed

in early 1984, allows real-time processing of interest rates and presents suggestions on where to invest money based on interest rates, Newquist said. Of the \$15 million the firm took in last year through interest rate swaps, \$1 million could be attributed to the installation of the expert system, Newquist said.

The police department in Seattle recently installed an expert system designed to help solve a case involving a serial murderer, Newquist said. In the four years since the first murder occurred, the police have collected more than 300,000 pieces of information, which are now displayed on a wall at headquarters.

The police hope the system, which is based on a Digital Equipment Corp. VAX, will allow its investigators to sort through the information and develop new leads in the case, Newquist said.

According to Mache Creeger, who

works at Lisp Machine, Inc., in Los Angeles, his company recently developed an expert system designed for process control. At present, the system is going through beta testing in six locations, including oil refineries.

Thomas Bylander, an Ohio State University graduate student who works at the school's artificial intelligence research laboratory, described the lab's current work with the Conceptual Structures Representational Language (CSRL), a language developed by the lab for use in expert systems. The lab has launched a variety of CSRL projects, including work on a system that will analyze automobile fuel problems and another that will detect welding faults.

The lab is also developing a system that will interpret data related to red blood cell antibody identification, which will be used to match blood types of patients and donors, Bylander said.

Mike Morgan, an engineer at General Dynamics Corp.'s electronics division in San Diego, said his firm is investigating how expert systems can be put to use in equipment maintenance. The company is currently focusing on developing an expert system that will diagnose technical problems in the U.S. Army's M1 tank.

"In the M1 tank, we want to be able to find out where a problem is and solve it quickly," he said. That will involve designing a system capable of analyzing information on the 63 black boxes and 1,400 connections that make up the heart of the tank.

Although many promising applications are now under development, Newquist warned the audience not to expect a retail version of an expert system to be available soon.

"Don't look for expert systems in Computerland or Businessland stores," he said. "You might see them in 10 to 15 years, but not before."

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NEWS

Study sees DSS taking bigger bite out of end-user budget

By Donna Raimondi
CW Staff

CHICAGO — Decision support systems (DSS) could account for up to a third of a corporation's information services budget and almost half of the end-user budget by 1990, preliminary findings from an MIT study showed. DSS will most strongly influence rapid, ad hoc decision making, will lead to better decisions and will offer an increasing number of alternative solutions to problems, said C. Lawrence Meador, chairman of the board of Decision Support Technology, Inc. of Wayland, Mass., and staff member at MIT's School of Engineering.

Meador and Fred L. Brachman of Brachman Associates in Penfield, N.Y., spoke on the topic "Decision Support Systems: the End User View" at a National Computer Conference session last week chaired by Ephraim McLean, associate professor of information services at the University of California in Los Angeles.

During the session, Meador and Brachman presented findings from a recent study designed to determine the current and future DSS needs of top information services and end-user management. The study, conducted by MIT, surveyed 102 companies in 28 industrial categories with revenues ranging from \$500,000 to \$40 billion, Meador said. According to Meador, the preliminary findings showed that end-user management and information services management are very close in their knowledge of and expectations for DSS.

Both of the survey groups agreed that the least important results of using DSS techniques will be increased teamwork, cost savings and better con-

trol, Meador said.

The most important technologies that will impact the development of DSS are end-user computing facilities, powerful desktop personal computers, fourth-generation languages and graphics, both groups of managers agreed. The least important technologies will be voice interaction, public subscription data bases and automatic programming, the study showed.

End-user management is very aware of the technology involved in implementing DSS, Meador said. Unfortunately, there is a lot of "smoke" on the fourth-generation language market, and information services will have to be careful about sifting through the smoke to get to the good packages, he said.

When it comes time to justify the implementation of DSS, end-user management and information services management both agreed that the promise of better decisions, end-user effectiveness and end-user demand for and commitment to DSS will be the critical factors, Meador said. Both groups indicated that company politics and the return on investment were not important to a purchasing decision. One important area of disagreement between the groups was that end-user management was unconcerned with the impact of DSS on information services resources, where that factor was important to information services leaders.

The study also revealed that if a new, inexpensive and effective DSS breakthrough suddenly became available, it would take an average of 4.2 years for companies to implement it. Although DSS will be very important to companies by 1990, it

takes a long time for companies to implement a working system, Meador said. The development life cycle goes through a variety of stages — planning, research and development, design, construction, testing, evaluation, demonstration, orientation, training, deployment, maintenance and adaptation, he said. Of those stages, design and construction offer few problems, Meador said, but front-end planning is seen by the managers as the single most important stage.

The implication of the study, Meador said, is that information services managers should plan on heavy DSS and end-user computing investments. In addition, they should plan to be using fourth-generation languages and expect knowledgeable users by 1990. End users should get into a planning and evaluation orientation, finding out how DSS can work for them, he added.

According to Brachman, once the decision to implement DSS is made, some basic issues will have to be handled. Information services must determine what position DSS will take in the firm, he said. There is an element of DSS that could fit into all areas of the company structure, he said, from the executive suite to the manufacturing floor. The company must decide where to start out, he said.

At Eastman Kodak Co., where Brachman spent 18 years, he started the DSS development effort in the finance area because the data base — a necessary ingredient in a DSS — already existed. Other areas require the building of data bases, a project that can take from six months to two years, he said.

Users call for communications networking standards

By John Dix
CW Staff

CHICAGO — Communications standards are critical to the future of networking, agreed users queried at last week's National Computer Conference, but the short-term implications are viewed with various amounts of criticism.

"Standards are extremely important, but they are not here yet," said James Hall, general manager of information services with Union Oil in Schaumburg, Ill. IBM's Systems Network Architecture (SNA) is a de facto standard, Hall said, but it is not all inclusive.

Ideally, standards will give users more product alternatives, Hall noted. For now, however, standards are more vendor rhetoric than actual

products, he said. The most important standards, according to Hall, will be those that define capabilities similar to those available with IBM's Distributed Office Support System and document handling architectures.

Bill Mulligan, director of administrative services with Rand McNally & Co., agreed that standards are extremely important. The lack of communications standards is holding back many technologies, such as micro-mainframe links, Mulligan said. "We have been hampered by the industry's inability in handshaking for too long."

The industry needs the equivalent of the standard yardstick, according to Ira R. Cash, a senior programmer analyst with Union Carbide Corp.

"There are 100 [fewer] vendors at this show than there were last year," Cash noted, a fact that he attributed to a slowdown in user spending spawned by equipment saturation. Users need communications standards to help them maximize their investment in this equipment, Cash speculated.

Cash said that his company is entering a second wave of decentralization. This transformation requires that each of the firm's divisions develop expertise in communications that, if they were available, would be greatly facilitated by standards.

'There are no standards'

"There are no standards," said Martin Gabret, a DP manager in the health care industry who also faults

SNA. "SNA has so many holes, it will never be a tight standard — kind of like Cobol."

Eventually, this will change, Gabret said, "especially if AT&T and IBM have to live together." Full standards would open up communications across vendor boundaries, he said. "We are all frustrated."

Vendors contacted said they are also eagerly awaiting national and international standards to which they can build. "Standards are absolutely necessary," according to Thomas Keating, vice-president of sales with Omnitel, a manufacturer of modems. "Nationally we are in pretty good standing in regards to standard transmission rates," Keating said, noting there is a need for further standardization.

NCC from page 1

tic signal to the computer industry, which is in the midst of a dramatic downturn. "I think we're beginning to see the end of the tunnel, in the sense that the exhibitors are saying they have found major buyers here in Chicago," he said.

By the time the show doors closed Wednesday, 85,123 people had registered for NCC, exceeding last year's attendance, Dowd said. Last year's NCC, which was held in Las Vegas, attracted about 65,000 visitors.

Dowd boasted that NCC '85 broke the existing second-day attendance record. The previous record was set in 1983 in Anaheim, Calif., where approximately 50,000 people registered by the close of the second day, he said. Dowd credited Afips' promotional activities — which included making complimentary tickets available at 140 computer retail outlets in Chicago and providing free buses from the downtown area — with the rise in attendance.

Although the number of visitors climbed, fewer companies exhibited their wares in Chicago than last year. This year, 564 companies signed up to

show their products, a 19% decline from last year's show, which attracted more than 700 exhibitors.

A number of prominent firms were absent from NCC this year. Included among the missing were Digital Equipment Corp.; Apple Computer, Inc.; Perkin-Elmer Corp.; Gould, Inc.; Compaq Computer Corp.; and Wang Laboratories, Inc. For some firms, the decision to sidestep NCC was reportedly based on a belief that resources would be better spent on vertical market shows.

Few product announcements

Only a few companies chose this year's NCC to announce products. In the microcomputer arena, networking products took the limelight. Sytek, Inc. announced a local-area network head end that is compatible with IBM's PC Network and can support up to 1,000 nodes within a 3-mile radius. 3Com Corp. unveiled the 3Server, a high-end addition to its family of local-area network servers that features a 70M-byte hard disk drive and a storage capacity expandable to 420M bytes.

As expected, Britton-Lee, Inc. extended its data base machine line into the office automation arena, introducing a relational data base server for a

local-area network. Designed to support data sharing in an office environment, Britton-Lee's new Relational Server RS310 is compatible with the firm's existing high-end IDM 500 series data base machines, the company said. It features a high-density 10-MHz data base processor and 1M.byte of direct-access memory, the firm said.

The show, held at a time when the industry is in a prolonged slump, was marked by further evidence that the downturn has affected some major players, with several companies announcing disappointing financial reports.

Last Monday, IBM reported that its second-quarter profits were down almost 13%, compared with the same period a year ago. NCR Corp. followed suit, also announcing a 13% fall in profits for its second quarter over last year's levels. Honeywell, Inc. later joined the chorus, saying its second-quarter profits declined more than 29%, compared with the same period last year.

The news was better for Sperry Corp., which reported sharply improved financial results for the most recent quarter. Its commercial computer operations reported increases of 33% in revenue and 64% in operating profits, the company said.

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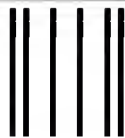
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Atlanta	Jul 25, Sept 18	Indianapolis	Sept 17	Rochester	Jul 23
Austin	Aug 6	Kansas City	Sept 12	Sacramento	Aug 8
Boise	Jul 30	Los Angeles	Jul 25, Aug 27, Sept 26	St. Louis	Aug 8
Boston	Jul 16, Aug 14, Sept 17	Minneapolis	Aug 1	Salt Lake City	Jul 16, Sept 24
Chicago	Jul 17, Sept 19	New Orleans	Aug 13	San Diego	Sept 10
Cincinnati	Sept 10	New York City	Jul 31, Aug 14, 28, Sept 11, 26	San Francisco	Aug 1, Sept 5
Cleveland	Aug 6	Newport Beach	Aug 14, Sept 17	San Jose	July 25, Aug 15, Sept 26
Dallas	Jul 16, Aug 8, Sept 11	Oklahoma City	Sept 17	Tulsa	Aug 15
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NEWS

End-user access to mainframes: Still no easy solution

By Maura McEnaney
CW Staff

CHICAGO — Visitors to the National Computer Conference (NCC) floor here have tried their hands at a variety of solutions for providing end users access to mainframe data — everything from homegrown configurations to slick, prepackaged facilities. None of those questioned by *Computerworld*, however, seem to have found the perfect solution.

The John Deere Co. is taking a basic step to micro-mainframe communications. At the corporation's engine works division in Waterloo, Iowa, Digital Communications Associates, Inc.'s Irma board is installed in approximately 25 of the compa-

ny's IBM Personal Computers to give users terminal emulation capabilities and allow them to log on to its mainframe for data access, according to Charles Doerr, manager of computer systems.

Deere has been using the Irma boards for about a year, he said. Admitting the link does not provide sophisticated file transfer capabilities, Doerr said, "The use of the link is not for everybody, and this is the simplest way of transferring data."

"We're still looking for an easy-to-use, one-step product," said David Ray, corporate DP manager at the Ciba-Geigy Corp. pharmaceutical company's Greensboro, N.C., plant. Right now the company is employing

in-house software to allow some of its 400 microcomputer users to access mainframe data for financial modeling.

Ray said the company selected the homegrown software "out of desperation. We needed something and didn't want the expense of the packages that are out today."

Ray said the capabilities of today's micro-mainframe links fall short of his expectations. "What's missing is a simple, user-friendly way to download information from the mainframe in a one-step process. Now, you must convert files to get to the mainframe, and format and convert files to get to the micro," he explained.

One company that is preparing to step into a prepackaged micro-mainframe link is Harte-Hanks Communications, Inc., a media holding company for newspapers, television and radio stations throughout the country.

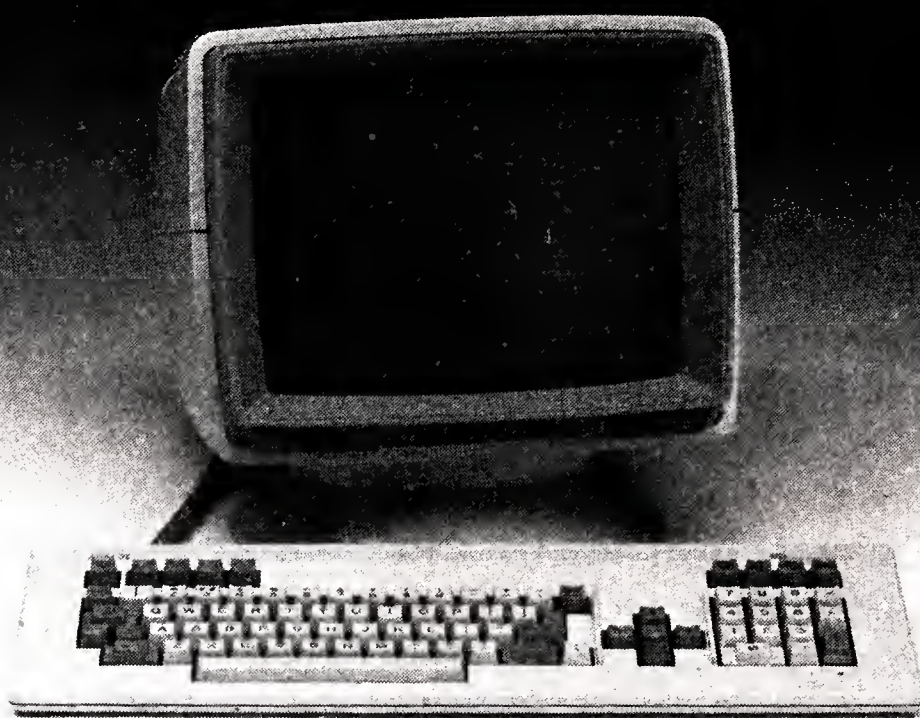
The San Antonio-based company is currently using Irma boards to give about 20 end users in the finance group access to corporate financial information.

Today, however, the company is searching for a better solution to allow users to retrieve financial information from its Cullinet Software, Inc. General Ledger package.

"Management told us to go out and find something that was better than the batch processing we were doing," said Bruce Flory, corporate director.

Harte-Hanks is considering the use of Cullinet's Goldengate package, which will tie users into the Cullinet data base, and allow end users to extract data from the Cullinet General Ledger package and download it into the Goldengate spreadsheet package,

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'Everybody claims to have a link, but when you look under the covers, it's an extract.'

— DP manager
Dow Jones & Co.

noted Homer Fauchaux, director of systems and procurement services.

Although the idea of a micro-mainframe link is attractive to many corporations, product selection requires careful consideration, users said. At the circulation department at Dow Jones & Co., giving end users access to mainframe data to create marketing reports would be a valuable capability, according to a company data processing manager who did not wish to be identified.

Dow Jones uses about 300 IBM 3270 Personal Computers, IBM Personal Computer XT's and Sperry Corp. microcomputers in its circulation department.

All requests for reports now come to the company's MIS department. When considering a micro-mainframe link, however, the company is looking to avoid products that require MIS departments to define the information that has to be extracted.

According to the DP manager, "Everybody claims to have a link, but when you look under the covers, it's an extract. We don't want to create another bottleneck for users," the manager said. "If they have to ask information systems to extract a file, they have to wait until we get around to it."

NCC attendees agreed that while giving end users access to mainframe data is often beneficial, too much access threatens security, and might be the factor that is preventing many companies from considering micro-mainframe technology. "There is still a degree of uncertainty about multiple users accessing a common data base," said James Stark of DVRY, Inc., an education and electronics information company.

NEWS

Inexpensive micro systems boost user-developed DSS

Need for credible systems critical

By Tom Henkel
CW Staff

CHICAGO — Increasingly powerful systems and rapidly declining memory costs have brightened the horizon for developers of decision support systems. But a panel of researchers at a National Computer Conference session, held here last week, warned that those increased opportunities also open the window for a rash of user-developed decision support systems (DSS) that are based on inaccurate data and invalid assumptions.

Noting the popularity of microcomputers, Miles H. Kennedy, an associate professor of professional management and decision systems at Case Western Reserve University in Cleveland, said that inexpensive systems have been a boon to user-developed DSS.

Comparing today's environments to the time-sharing mainframe environments that existed 10 years ago when the first DSS were developed, Kennedy said early DSS could consume an entire mainframe and cost \$20/hour to use. This made the widespread use of DSS uneconomical.

"On an average evening in Cleveland, more decision support systems are written today than in the past 10 years," Kennedy said.

Management tool

He quickly added that future DSS will become even more popular as managers discover the software can be used as a persuasive management tool.

But to make DSS effective management tools, Kennedy said, there is still much work that needs to be done.

For example, improvements in networking technologies and better I/O devices and graphics will be a catalyst for moving DSS into the mainstream of office automation and

electronic mail systems.

Structural changes in the way DSS are developed could increase their credibility as tools.

Kennedy said DSS have been designed that can give users an explanation of how their recommendations are reached.

"What-if [analysis] is not good enough; we need 'how-come' [explanations] as well," according to Kennedy.

Credible DSS a critical issue

Developing and maintaining credible DSS are perhaps the most critical issues facing DSS users and developers, Kennedy said.

"I worry a lot that there are people making decisions based on models they have not debugged," Kennedy said.

But even if users develop flawless decision support systems, according to Gary W. Dickson, a professor of management science at the University of Minnesota, it may not help managers make better decisions. Dickson said it has not been conclusively proven that providing managers with better information, graphics or systems will improve the managerial decision-making process.

Dickson said DSS that not only make recommendations but explain how those recommendations were reached would be more helpful to users.

Information centers a boon to end-user computing

CHICAGO — The difference between an information center and an MIS department is that an information center does not do any coding.

Henry Delevati, from Information Builders, Inc. in New York, made that distinction at "Managing Information Centers," a National Computer Conference session held here last week.

An information center should provide the expertise, tools and training to enable an end user to develop his own data processing solution, according to Delevati. Support should continue after the user has written the application. This service separates an information center from a typical corporate training center.

The information center is one of four alternatives facing a user when he determines how to solve a data processing problem. The three other methods are manual means, a traditional MIS application or a time-sharing application.

Not all uses suitable

There are a number of applications that are not suitable for an information center, according to Delevati. "A user could develop a department application, but a payroll system with millions of records should be written by an MIS department," he said.

Information centers can supply significant benefits for certain other applications. He cited one case in which an application developed with the help of an information center and maintained by an end user replaced a time-sharing application. "As soon as the application was completed, the company began saving \$100,000 a month," Delevati said.

Bart Benne, who works at the information center at Texas Instruments, Inc., claimed that information centers saved the company \$19 million in 1984. The figures were supplied by users who responded to a

questionnaire.

The firm has information centers in more than 18 countries, and 14,000 Texas Instruments Professional personal computers are tied into a central network. "When we put the network in place, we had to set strict communications parameters," Benne noted.

One reason for the success of Texas Instrument's information center, according to Benne, was top-level management support. "There were 19 people with an average of 16 years of MIS experience hired when the centers first opened in 1983," Benne claimed. There are now 38 people working in the information centers.

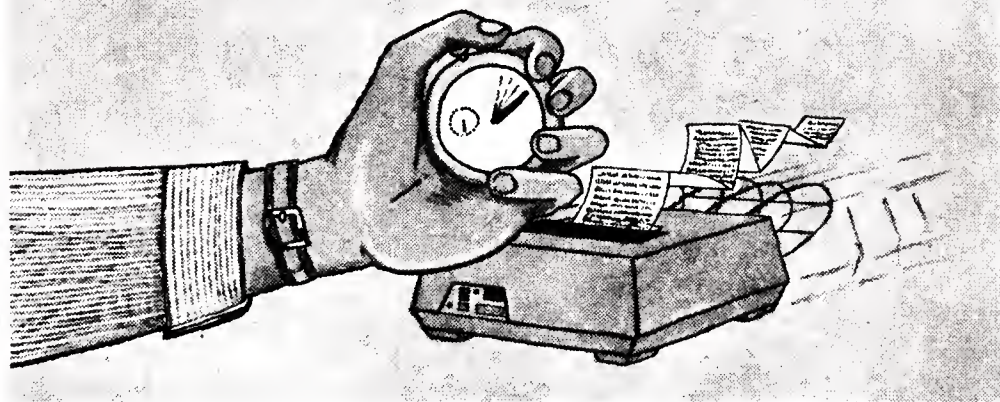
Shifting to end users

Shifting smaller applications from an MIS department to an end user can supply some benefits. One benefit may be alleviating an MIS application backlog. "It is similar to the benefits that happened when companies shifted from assembler to Cobol for application development," Delevati noted. "Some companies may experience a five- to tenfold increase in application development."

Better working relationships between users and data processing departments was another benefit that Delevati listed. "Once a user develops his own application, he is better able to think through his data processing needs," Delevati said.

Another advantage of information centers was better use of corporate data. Delevati claimed that \$30 billion worth of data processing spending goes to blue-collar workers and only \$5 billion is used by white-collar workers. "We have to find a more equitable way of getting corporate information in the hands of top managers," he said. "End-user computing and information centers may aid that process."

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NEWS

Macintosh gaining acceptance in corporate world

Users cite system's graphics, ease of use

By Kathleen Sullivan
CW West Coast Bureau

CHICAGO — Although the IBM Personal Computer has taken the lion's share of the corporate market, Apple Computer, Inc.'s Macintosh still has a place in serious business computing. That was the consensus of a group of National Computer Conference attendees here who responded to an informal *Computerworld* poll on the viability of the Macintosh as a serious business machine.

Although most respondents said

the Macintosh has some advantages over its arch rival — the IBM Personal Computer — one respondent was not quite so sure.

Robert C. Locker, director of marketing and administrative services, Eastman Kodak Co., Rochester, N.Y.

Locker said he felt it is too early to write off the Macintosh in the corporate environment. The Macintosh is just coming into its own in the business world, he said.

"I think it's becoming a serious business machine," he said,

noting that a broad range of Macintosh business applications programs have entered the market.

Although the IBM Personal Computer and its look-alikes "crept in and stole a part of the show," the Macintosh still has an edge over these systems because it is easy to use, according to Locker.



Locker

Janette Moore, MIS program administrator, American Academy of Dermatology, Evanston, Ill.

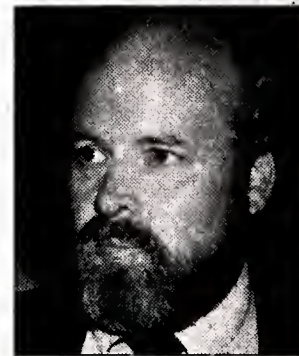
Moore described the Macintosh as "a nice home computer." But she said that it lacked the crucial telecommunications capabilities that would allow the machine to become a serious contender in the office environment.

"Like a lot of other companies, Apple expected third-party vendors to create telecommunications programs for the Macintosh," according to Moore. "But only Macterminal is now available." That presents problems for some of the academy's members who own Macintoshes and want to gain access to the academy's data base, she said.

Raymond E. Barber, director of MIS, TRT Telecommunications Corp., Washington, D.C.

Barber echoed Locker's remarks, saying that the Macintosh was much easier to use than the IBM Personal Computer.

Since TRT has already standardized on IBM systems, however, it is questionable whether the firm will adopt Apple's Macintosh, according to Barber.



Smith

"We've been debating that question lately," he said.

Mike Smith, senior vice-president of systems development, Rainier Bank Corp., Seattle.

The Macintosh has already found a place at Rainier Bank.

There, more than 50 Macintoshes are being used in the engineering department for word processing and document preparation applications, Smith said.

"We use IBM in our office automation environment," he said.

"But when we want to design documents, we use the Macintosh," he added.

Stratis Sapuntzakis, UOP, Inc., Des Plaines, Ill.

Since Sapuntzakis' firm does chemical and petrochemical processing design, he noted that the Macintosh was appropriate for specialized applications.

One group of UOP employees bought Macintoshes for its plant control work, according to Sapuntzakis.

"They're using it because of its graphics," Sapuntzakis said.

"That's the strength of the machine, and that's what they're using it for," he added.



Sapuntzakis

Harold H. Diepholz, development engineer, AT&T Technologies' computer systems center, Lisle, Ill.

Diepholz gave the Macintosh a vote of confidence.

"I would say, yes, it is a serious business computer," he said. "It runs the same major business programs as the IBM Personal Computer, such as [Microsoft Corp.'s] Multiplan and Word.

"And now, [Lotus Development Corp.'s] Jazz is also out," he said.



Diepholz

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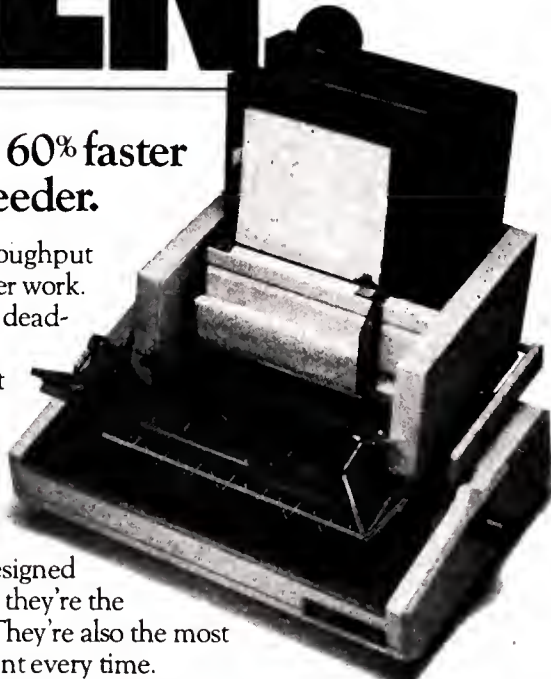
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NEWS

Do software vendors sell solutions or technology?

By John Gallant
CW Staff

CHICAGO — *Solutions.* In the software industry, that is one of the most pervasive buzzwords. Vendors claim to sell not just software, but solutions to the pressing problems facing users.

But how do those users feel software vendors are doing at providing real solutions?

Computerworld took to the floor of the 1985 National Computer Conference (NCC) here last week to put together a report card on software makers.

NCC visitors were asked the following question: "Are software vendors really selling solutions — or technology in search of solutions?"

Ruth Willits, vice-president, Northwest Bank & Trust Co., Davenport, Iowa.

"I think software companies are doing a pretty good job overall. With very few exceptions, all the software we have purchased has done what it was supposed to do. If there is one piece of advice I would give to vendors it would be to lower their prices. Software prices have fallen, but not far enough."

Tauna Abel, micro-computer specialist, Northwest Bank & Trust.

"So far, we are very happy with the software we have purchased. I think the vendors could be a little more flexible in the types of user training they provide."

"But we are quite comfortable with the packages we use."

Mel Litvin, president of the Data Printer Division of Printronix, Inc., a manufacturer of computer printers, Irvine, Calif.

"That question could not come at a more appropriate time. Three of our divisions are currently in the midst of converting to new data base management systems (DBMS)."

"Every division thought it had selected the best product, but manage-

ment has found it is not that easy to implement the systems. The divisions have had pretty mixed results with the software vendors, who, I think, could do quite a bit to improve their performance."



Bryce

Hamish Bryce, director, Thorn EMI Information Technology, Middlesex, England.

"I think the companies that are successful are selling real solutions. But I think that, on the whole, they could all do a better job. Software ven-

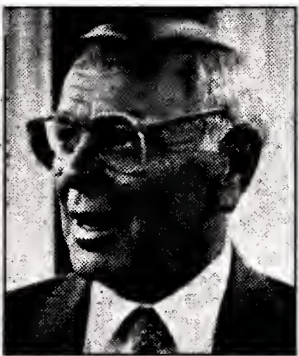
dors' performance will become even more critical in the future. Most users are not interested in computers or how the product is implemented. They are just looking for bottom-line answers. So what the vendors provide will increasingly be the key to success."



Willits

Jeffrey Hunter, network administrator, John Deere & Co., Moline, Ill.

"I think the vendors are selling a little of both. One big problem with software is the documentation. It is not designed to be easily read and understood. The learning curve with new products is just too high. It is too tough to train users."



Litvin

"The initial start-up period with a new product is a big hurdle. Once users learn how to use the packages, they are great. Then, they really are a solution. But the training and adaptation are tough," Hunter reported.

Kelly Havens, assistant director, user services, computer center, University of Notre Dame.

"I think the companies are meeting users' needs. Otherwise, the software products would not sell. They are doing what needs to be done," Havens said.

Mark Eggers, consulting programmer, user services, computer center, University of Notre Dame.

"In certain areas, software is just not meeting users' needs. For exam-

ple, many vendors seem to be refusing to provide local-area network versions of products."

"Also, in terms of software licensing, the vendors just are not doing what needs to be done to end piracy and solve user problems. My advice to them is to be more in tune with developments in hardware and make their products take advantage of those developments."

"I think they should improve the communications capabilities of their packages to allow people to share information better."

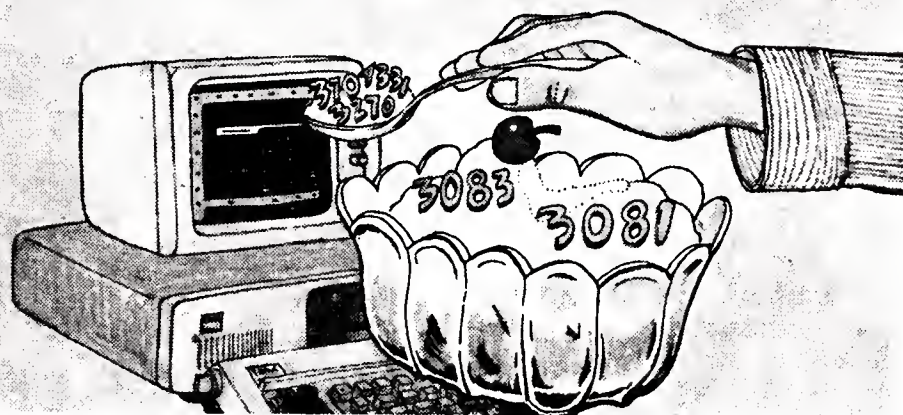


Kleist

Robert Kleist, president, Printronix.

"I agree. The question is very apropos. Software vendors call themselves solutions vendors, but we are finding out very quickly which of them really do provide solutions. Two of our divisional DBMS projects are going well, but the third division is having some difficulties. The package that division has chosen was supposed to be wonderful. But, to date, it has only achieved what I would call an elitist MIS following."

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NEWS

Operating systems integral to local net transparency

Make net more accessible to user

By Charles Babcock
CW New York Bureau

CHICAGO — Evolving local-area network operating systems have become the key to making networks' capabilities more accessible to users, panel members said at a National Computer Conference technical session here on "The Arrival of LAN Operating Systems."

"The local-area network is only as good as the software that manages it," said panel member G. Craig Burton, vice-president of Novell, Inc. of Orem, Utah, producer of the Novell Netware operating system.

In the past, when a user moved an application program from one point on the network to another, he experienced "a high probability of application failure," explained panel member Gerald Popek of Locus Computing Corp., the Santa Monica, Calif., manufacturer of the Locus local-area network operating system.

Likewise, transferring data around the network ran the risk of altering the data, or worse, losing it as wrinkles in network management caused unexpected changes in how it was handled, Popek continued.

Underlying technology

Part of the difficulty was the network's dependence on the user "understanding the underlying technology" and adopting the right codes and formats to suit the destination he was trying to reach on the network, Popek said.

All locations on the network should be transparent to the user, and this capability must be built into a sophisticated, third-generation local-area network operating system, he said.

In addition, local-area net system developers say the operating system should allow a user on the network to access any application and have it run the same as it would at the point where it originates.

A user should be able to use peripheral devices without having to tell the network their location.

Net transparency

Such steps toward network transparency will make local-area networks more useful to the growing number of personal computer users who need network services but who cannot afford to devote much time trying to access them, said Noel E. Schmidt, session leader, whose Architecture Technology Corp. in Minneapolis is a consulting firm on configur-

ing local-area nets.

Local-area net operating systems discussed by panel members, in addition to Locus and Novell, included a new version of Concurrent from Digital Research, Inc., Concurrent-DOS 286; and PC-NOS from Applied Intelligence of Mountain View, Calif.

E. Michael Loftus, market-

ing manager for Digital Research's System Software Division, said a redirector, or extender of the local-area net operating system, can provide network transparency to users.

Functions independently

The redirector "functions independently from the operating system," taking calls to

the printer, disk drives and other devices and redirecting them to the proper place.

Through the redirector, incompatible equipment can be linked together on a local-area network and remain accessible to all users, he said.

Complete user transparency allows any user to tell as soon as he logs on the network the node in which he is

operating and what network services he has, Loftus said.

Although they can be rigged to deal with a variety of devices, local-area net operating systems like Concurrent-DOS and Novell Netware are oriented to serving microcomputers and peripherals that use the IBM PC-DOS or MS-DOS operating systems, the spokesmen said.

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NEWS

Hayes Microcomputer to endorse X.25, X.PC protocols

By Eric Bender
CW Staff

CHICAGO — Hayes Microcomputer Products, Inc. last week disclosed plans to support two additional communications protocols, the CCITT X.25 standard and Tymnet, Inc.'s X.PC, in future products.

Hayes, the leading supplier of microcomputer mo-

dems, will adopt X.PC for asynchronous communications and begin using X.25 as personal computer communications become synchronous, according to Gary Betty, Hayes marketing vice-president.

The move is designed "to overcome the confusion that exists over protocols," Betty said during an announcement

at the National Computer Conference (NCC) held here last week.

Many firms have held off expanding their personal computer communications links because of uncertainty about which protocols they will be required to support, Betty added.

X.PC will provide improved error-checking capa-

bilities, support for multiple-host sessions and other features that will prove crucial as transmission speeds increase and microcomputer communications become more critical to businesses, Betty said.

He also noted the widespread adoption of X.25 as an interface standard by most value-added network

carriers.

Hayes examined several other widely used protocols that have been proposed as standards, including Microcom, Inc.'s Microcom Networking Protocol.

Path for future

Among the reasons for endorsing X.25 and X.PC, Hayes felt that the protocols "had to be in the public domain, had to be supportive of international standards, had to meet the needs of today's environment and had to provide a migration path for the future," Betty said.

Current Hayes products support the proprietary Hayes Verification protocol and the Xmodem protocol. Future software products reportedly will be compatible with all Hayes software based on those protocols.

Hayes will publish the specifications for its implementations of X.25 and X.PC, as it did for its modem command sets, which Betty asserted have become a de facto standard.

No delivery schedules for products incorporating the newly endorsed protocols were announced.

Additional information is available from Hayes through P.O. Box 105203, Norcross, Ga. 30348.

VDT-related angina found

SAN FRANCISCO — A study by the Computer Workers of America (CWA), a 650,000-member union, and the North Carolina Occupational Safety and Health Project, has found a correlation between working with a VDT and an increase in incidents of angina — chest pain that is often the first sign of heart disease.

The study sampled 1,000 telecommunications workers in North Carolina and found that 18% of VDT workers aged 30 to 39 experienced angina compared to a general average of 4%.

Other health problems cited by the study were increased eyestrain, musculoskeletal problems and increased stress.

The president of the CWA called upon the U.S. government to conduct more extensive research into the area of possible VDT health problems.

A CWA spokesman reported that the union plans to file a health hazard request with the Cincinnati offices of the National Institute for Occupational Safety and Health's Hazard Evaluation Services Branch.

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NEWS



Kelleher

OSCAR & ASSOCIATES, INC. PHOTO

Display top priority for laptop shoppers

By Edward Warner
CW Staff

CHICAGO — Those interested in buying a laptop portable personal computer are looking for three things: display, display and display.

That was the response offered by several National Computer Conference attendees interviewed by *Computerworld* on the show floor last week.

Robert D. Kelleher, manager of data center operations for Alberto-Culver Co. in Melrose Park, Ill.

"I'd love to have one in my office for my own purposes," Kelleher said. As he spoke, Kelleher was examining the NEC Home Electronics, Inc.

PC-8401A, a 4.7-lb machine with built-in Micropro International Corp. Wordstar software and an LCD. Kelleher said he had no problems viewing the screen but estimated that its 16-line display would not be as useful as the 25-line displays he is accustomed to using on his company's mainframe data terminals.

The quality, rather than the size, of the display of another laptop at the show, the Data General Corp. Data General/One, was an issue for some attendees.

William Lydon, manager of future product planning for Johnson Controls, Inc., in Milwaukee, Wis.

Lydon said that Johnson Controls

had considered buying several DG/Ones and had even worked with a demonstrator model but found the machine's screen "didn't appear to be readable." The Hewlett-Packard Co. 110 laptop was unacceptable for the same reason, he added. "The desire [in the company] is to have laptops," Lydon said. "It's just a question of getting something usable."

Though Lydon said he found that the NEC PC-8401A's display "looks better than the [DG/One]," another visitor to the NEC booth said he couldn't "read it very well from here," as he stood an arm's length away.

August H. Blegen, executive director of the Association of Data Communications Users, located in New York.

Blegen said he had been considering the purchase of a laptop, but was holding off for at least a year until improvements in technology brought down the prices of laptops and improved their screens. Price is going to be important, he elaborated, because

”

'The desire [in the company] is to have laptops. It's just a question of getting something usable.'

— William Lydon
Johnson Controls, Inc.

"people are going to have this [laptop] as an adjunct to something else," most likely a desktop computer. A good price, he added, would be about \$1,000.

Jesus Briso-Montiano Moral, general director of the Jebrimont computer dealership in Madrid.

Briso-Montiano, while looking over a Grid Systems Corp. Compass laptop, said he liked the machine's electroluminescent display but not its \$3,450 price. "This particular machine is good but too expensive for Spain at the moment," he said.

S. M. Krzyzaniak, Cobol programmer with Natural Gas Pipeline in Lombard, Ill.

Krzyzaniak said screen resolution was the most important laptop feature for her needs. She said she was also concerned with a laptop's appearance.



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NEWS

Inman urges investment of resources in technology

Information handling called critical to gains

By Clinton Wilder
CW Staff

Investment of human and financial resources in technological advancements is essential, both for economic growth and global stability. So said retired Adm. Bobby R. Inman in the keynote address of last week's 1985 National Computer Conference (NCC).

Inman, chairman and chief executive officer of Microelectronics and Computer Technology Corp. (MCC), called on major institutions in both the private and public sectors to spur investment in emerging technologies and to muster the human talent to foster, manage and market them. He said corporations, universities and the federal government must emphasize innovation, long-term planning and partnerships among themselves and other nations in order to succeed in the remaining years of this century and beyond.

"Information handling has been at the heart of gains in every major area," Inman said, "and it will continue to be critical to all the gains that beckon ahead of us."

In addition, Inman said, postwar economic alliances among the U.S., Japan and Western Europe have been the critical factors in avoiding global military conflict for the past 40 years. Citing a "turbulent period of change in Soviet leadership" in the next several years, Inman said the world's economic and military balance of power may rest on U.S. economic cooperation with its allies.

'Most critical element of the future'

"A Soviet decision on whether to assert their conventional military power may rest on how they judge the cohesion of the Western alliances," Inman said. "How we hold those, and avoid trade wars and trade barriers, may be the most critical element of the future. The information-handling industry is at the cutting edge, not only for its own growth but for hope for a peaceful and stable world."

Inman sounded many such global themes in his remarks in the Arie Crown Theater at McCormick Place. He said a critical area for the future of the microelectronics field lies in the fast-growing economies of several Asian countries, including nations of the Pacific Basin and China. "In these nations, we face very tough new economic competitors but also see the creation of vast new markets," he said.

Inman specifically urged American industry to move ahead quickly in factory automation and to accelerate the process of converting research and development advances into marketable products. "The No. 1 priority for industry is to accommodate the accelerated pace of change," he said. "Far too little effort has been focused on manufacturing technology, especially in developing [an industrywide] systems approach."

Inman, former director of the National Security Agency and deputy director of the Central Intelligence Agency, said government must play a much greater role in technology ad-

vancement than it has to date.

He said existing public funds, for example, should be channeled from federal farm subsidies to programs to educate farmers about emerging agricultural technology.

He urged the Federal Reserve Board to create a "model financial transaction system for the 1990s" that could be made available to commercial banks. "The government must focus existing revenue on



Inman

long-term problems," he said.

Inman called for reform of American education at every level and for retraining of displaced workers, both to prepare citizens better for a technology-oriented world.

Inman praised the current controversial effort in his native state of Texas to prohibit failing students from participating in athletics. "In the Southwest, one approaches the subject of interscholastic football

with great trepidation," Inman said, drawing laughter from the audience.

"But we must change our attitude from one of keeping students happy to getting them prepared. Our No. 1 need is talented people, and investment in education at all levels is the most critical step toward meeting those needs."

Inman said that the current computer industry downturn is a cyclical phase and he remains optimistic for the future. "We are in a slump, but it is a slump in the rate of growth," he said. "As an industry matures, it is increasingly difficult for start-up companies to find niches, but there are 181 new companies [exhibiting] at NCC."

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NEWS

Britton-Lee introduces server for office data sharing

By John Gallant
CW Staff

Britton-Lee, Inc. is slated today to extend its data base machine line into the office arena with the introduction of a relational data base server for a local-area network.

Scheduled to be unveiled at a press briefing this morning, Britton-Lee's Relational Server RS310 was designed to support data sharing in an office environment, a spokesman said. Compatible with the firm's existing high-end IDM 500 series data base machines, the RS310 utilizes a high-density 10-MHz data base processor and 1M byte of direct access memory.

The system reportedly will come equipped with up to 170M bytes of Winchester disk storage and a 60M-byte cartridge tape drive. With its Ethernet local-area net, the RS310 is said to act as a relational data server for an en-

tire departmental net. The system offers the capability to process up to 10 simultaneous queries and can serve up to 50 network users.

Like Britton-Lee's other data base machines, the RS310 is said to operate simultaneously with computers from different manufacturers, allowing users on diverse processors to tap into

a common data source. The RS310 is slated for general availability in the first quarter of next year and will be priced at \$45,950.

At today's press briefing, Britton-Lee is also expected to announce Release 3 of its host data base machine software with support for eight different hardware and operating system environments.

The host interfaces for Britton-Lee's processors include Digital Equipment Corp. VAX processors under VMS; University of California at Berkeley Unix 4.2; DEC's Ultrix implementation of Unix; AT&T Unix System V; IBM Personal Computers under Microsoft Corp.'s MS-DOS; and AT&T's 3B20, 3B5 and 3B2 under System V.

Release 3 of Host Software allows the Britton-Lee machines to attach to and support the above computers.

Britton-Lee is also slated to introduce a faster 10-MHz data base processor and a disk controller for its 500 series systems.

Britton-Lee is located at 14600 Winchester Blvd., Los Gatos, Calif. 95030.

Japanese defended

By Susan Blakeney
CW Staff

Shuji Masuda is fond of saying that when the U.S. economy sneezes, Japan catches a cold. After speaking with Masuda, one might get the impression that Japan is busily stockpiling its medicine cabinet with cold remedies.

Masuda, Hitachi America Ltd.'s manager of peripheral systems marketing department, was at the National Computer Conference this week. He used the occasion to dispel some of the negative coverage that Japanese companies have suffered in the U.S. press lately, to argue for better trade relations between the U.S. and Japan and to announce three Hitachi products: the MT310-X tape storage subsystem, called MT300-X; the OL301-2 optical disk library system; and the Intelligent Peripheral Interface-3 storage controller.

With respect to the present economic confrontations now plaguing Japanese and U.S. electronics companies, Masuda said the Japanese are trying to move as fast as they can.

"It's like a horse race. You don't have to be the top runner to be competitive — or to be rewarded."

As for allegations that Japanese firms are guilty of dumping their products in the U.S., he responded strongly by saying that the U.S. economy, and therefore its pricing, is artificially ma-

See JAPAN page 19

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NEWS

Bridge unwraps communications tools for TCP/IP nets

By John Dix
CW Staff

Bridge Communications, Inc. introduced, at last week's National Computer Conference, communications servers and network gateways for Ethernet-type networks that use the Department of Defense's Transmission Control Protocol/Internet Protocol (TCP/IP).

TCP/IP, standardized for use by the DOD for defense networks, are higher-level protocols that provide net and transport services above the physical and data link protocols defined and used with Ethernet. The protocols are an integral part of the University of California at Berkeley's Unix 4.2 operating system.

The products include the following:

- The GS/3-IP, a gateway used to interconnect remote TCP/IP-based Ethernet networks.
- The CS/1-SNA-TCP/IP server, which enables hosts on a TCP/IP network and products with Bridge server interfaces to access IBM Systems Network Architecture

(SNA) hosts over Ethernet.

- The CS/100-TCP/IP terminal server that connects up to 14 RS-232 devices to a TCP/IP-based Ethernet net.

These products reportedly complement Bridge's previously announced CS/1-TCP/IP server that supports from eight to 32 devices.

The GS/3-IP gateway enables up to eight TCP/IP-

based Ethernets to be interconnected using dial-up or leased lines. Line speeds supported range from 1,200 to 64K bit/sec. Data transfer rates between Ethernets can reportedly reach 175K bit/sec.

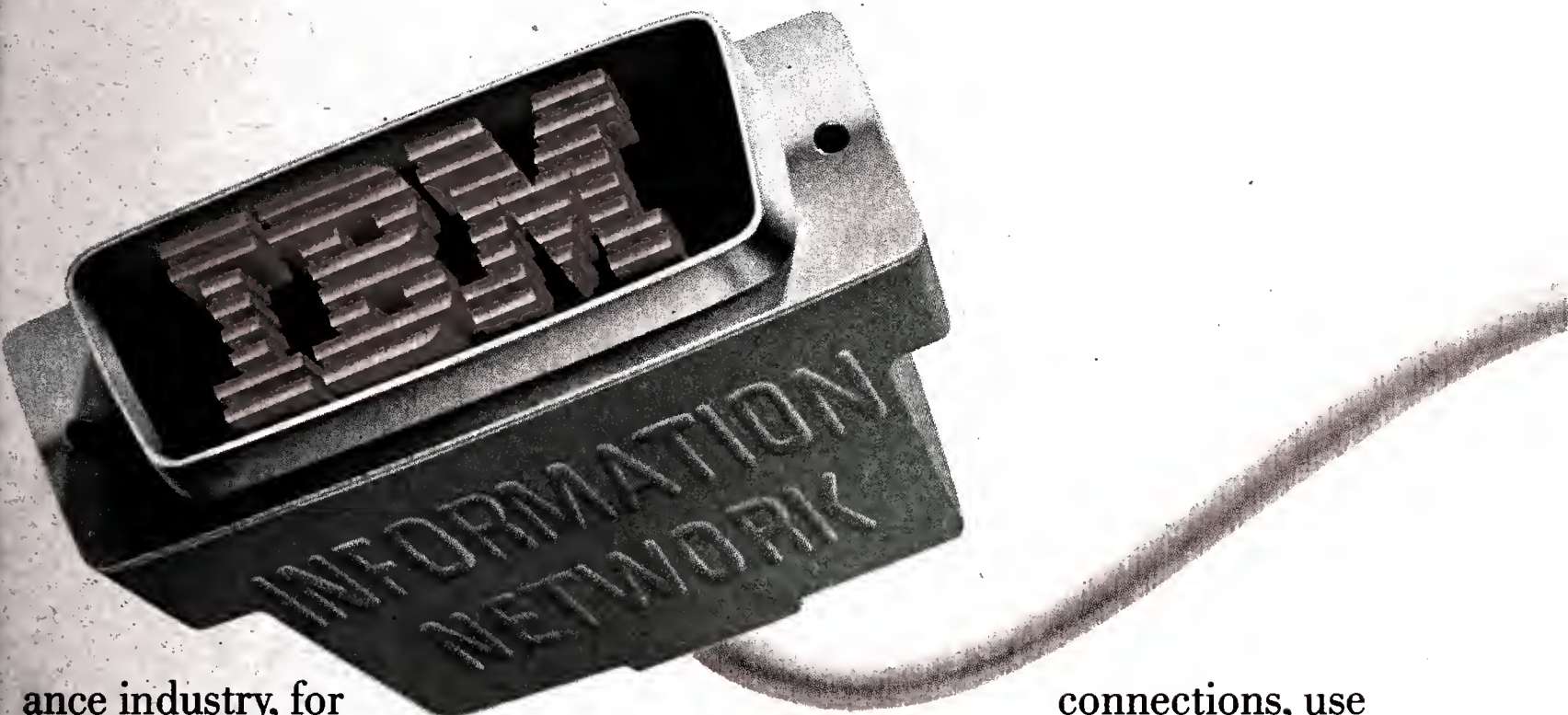
The CS/1-SNA-TCP/IP was designed to enhance communications between engineering and traditional data processing shops, according to the vendor.

The server reportedly enables users of engineering workstations that support TCP/IP — such as Sun Microsystems, Inc. and Masscomp Co. equipment — to use Ethernet to establish a TTY window for IBM 3278 screen emulation.

This new SNA server is said to provide full network connection and the necessary protocol conversion, enabling terminals and personal computers on the network to emulate IBM 3278 displays. The protocol conversion function is reportedly provided on a port-contention basis.

Available immediately, the CS/100-TCP/IP costs \$5,400 for a 14-port box, plus a \$250 annual software fee. The CS/1-SNA-TCP/IP costs \$13,000 and carries a \$1,000 annual software license fee. The GS/3-IP will reportedly be available in October for \$10,500 with a \$250 yearly software license.

Bridge is located at 1345 Shorebird Way, Mountain View, Calif., 94043.



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JAPAN from page 18

nipulated. "[The U.S. government] is keeping the interest rates high, and it is keeping the exchange-rate high. This hurts U.S. companies as well as Japanese firms that are doing 30% to 40% of their business overseas. It's to everyone's benefit that high U.S. interest rates and the foreign exchange imbalance be addressed very quickly."

In addition, he claimed that pricing products low enough to be successful in a market was not unfair if the prices remained low after the vendor had captured that market. "That is the real challenge to Japanese companies," he said.

Furthermore, Masuda contended that a truly competitive environment does not just mean pricing products strategically, but making the product superior in several ways: product performance, reliability, service and support, availability and uniqueness.

"If people come by our booth, they will see that Hitachi has good products. This undoes some of the bad image we've gotten lately," Masuda added.

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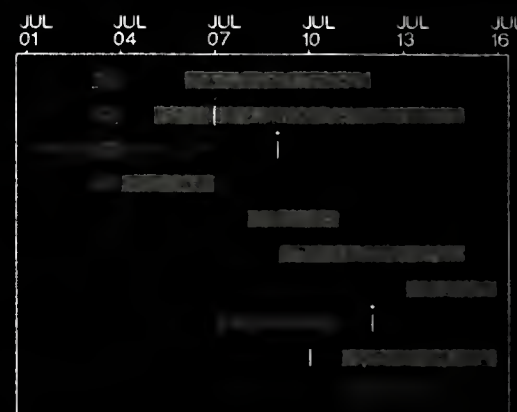
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8	POUR FOUNDATION
9	INSTALL PIPE
10	ERECT TOWER



SYSTEM

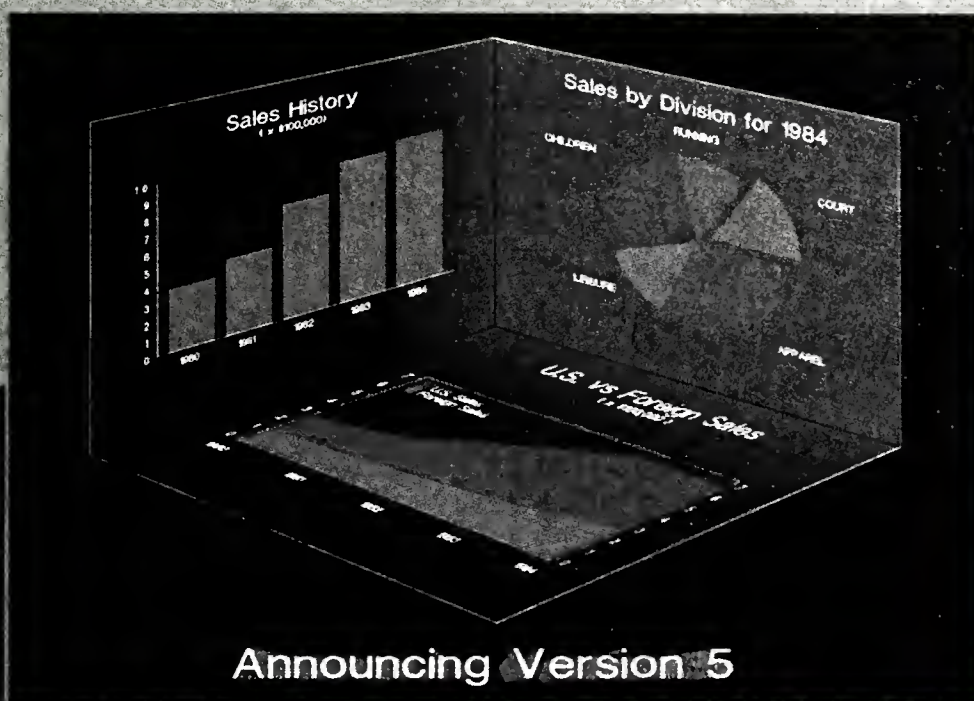
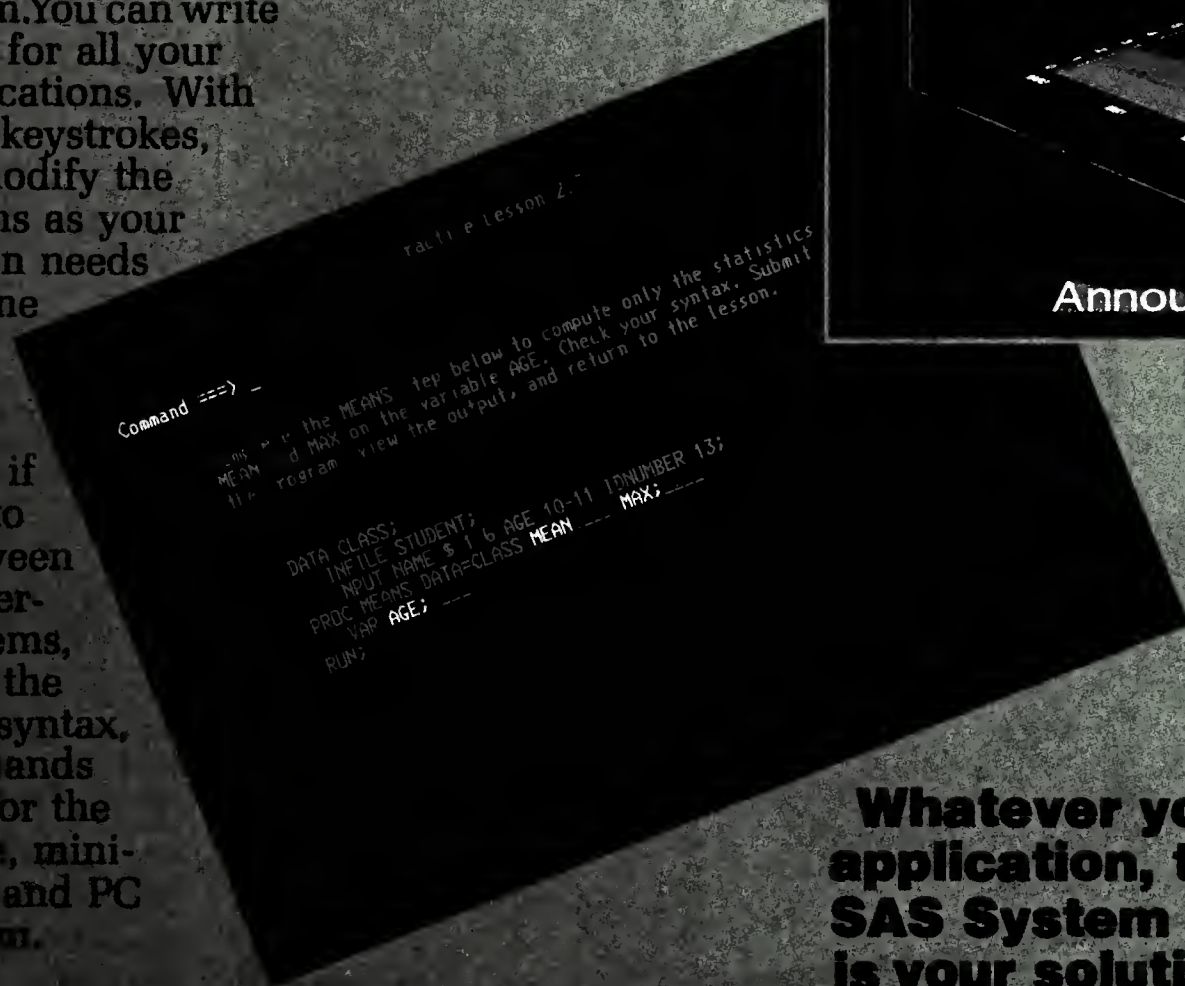
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NEWS


WORLD DIGEST
 CW International
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RANGOON, Burma

— One of Asia's least automated countries is taking a cautious step into the computer age with the installation of three superminicomputers at key government ministries. Until now, government users here have had to line up for scarce

time on an old Model 1902S computer from the UK's International Computers Ltd. (ICL), reputedly the last of its kind in operation anywhere in the world.

This machine, located at Rangoon University, suffers frequent breakdowns and lacks spare parts, since ICL no longer makes parts for it. However, since 1971, the 1902S has been the mainstay of government computing here.

Still, Burma's leaders re-

portedly remain largely ignorant of computing and apprehensive as to its effects on this nation's rigidly planned and controlled economy. Computer imports have to be cleared individually at the cabinet level — it is estimated that there are just 10 minicomputers and 35 microcomputers in this country of 37 million people. Visitors arriving at Mingaladon Airport here carrying personal computers have them impounded by Burmese customs officials

until they leave.


OTTOWA — Bell

Northern Research (BNR) has announced the opening of a \$3.5 million laboratory where prototypes of advanced circuits will be built. The lab is part of a \$14.4 million project to develop the capability to produce gallium arsenide semiconductor circuits for high-speed logic and memory applications. Cost of the project is being split by

BNR and the National Research Council of Canada.

Research will focus on optimizing the operational speed of gallium arsenide circuitry in communications systems while increasing the number of tasks the circuits can perform. Potential applications for the circuits include use in high-speed data processing systems and fiber-optic transmission systems.


TOKYO — Sales of the top 10 computer manufacturers in

Japan, including mainframe, mini and microcomputer makers, increased an average of 24% in 1984, according to *Computerworld Japan*. IBM Japan was bumped from second to third place in domestic sales by NEC Corp. Export sales grew more than domestic sales, and IBM Japan was the leading Japanese exporter.


BANGKOK, Thailand

— The state-owned Krung Thai Bank, which serves rural areas of the country as well as the capital, will install approximately 250 automated teller machines nationwide over the next five years. The ATMs are leased machines bearing the label of N.V. Philips, a Dutch firm. The machines are made by Diebold, Inc. of the U.S. They will be linked to Philips PTS 6813 processors at six regional centers, which in turn will be hooked up to a Tandem Computers, Inc. Nonstop II configuration here, acting as a message switch. This decentralized network approach minimizes the number of expensive long-distance leased lines required, while permitting full interbranch communication.


BANGKOK, Thailand

— In a surprise switch, long-time IBM stronghold Siam Commercial Bank has become the second bank in Thailand to buy Nixdorf Computer AG's automated teller machines, following the lead of Bank of Ayutthaya, which recently became the West German manufacturer's first Thai customer. The ATMs will be linked to a Nixdorf 8864 mini, which will act as a front-end to the bank's two IBM 4381s. The bank would not say how many of the Nixdorf terminals it will install.



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NEWS

SURVEY from page 1

tle change in this category over the previous year.

There were a few notable exceptions, however. As the rise in its users' overall satisfaction rating indicated, Harris appears to have made a remarkable turnaround during the past year. In the 1984 survey, only 57.14% of Harris users polled said their systems met expectations. This year, that percentage rose to 85.71%.

The news was not as rosy for McDonnell Douglas Corp.'s Microdata division and Sperry Corp. Both showed dramatic declines in the category, according to Datapro. In 1984, 91.03% of Microdata users polled said their systems fulfilled expectations. This year, that percentage slipped to 88%. In

1984, 81.36% of Sperry users polled said their systems lived up to expectations. This year, 74.29% said they did.

Datapro also asked the respondents to its 1985 minicomputer user survey whether they were willing to recommend their systems to others. Eighty-seven percent said they would. There were two exceptions to the generally positive response, however: Sperry's System 80 and Digital Equipment Corp.'s VAX-11/785.

According to Datapro, its survey disclosed that 65.71% of System 80 users responding were willing to recommend that system to others, while 14% said they would not. Twenty percent said they were undecided. Of VAX-11/785 users who responded, 63.64% said they would recommend their

system, while 27.27% said they were undecided.

Three vendors were omitted from this year's Datapro survey. MAI/Basic Four, Inc. and MDS Qantel Corp. processors were not included because, according to Datapro, these vendors were not listed on at least five responses to its questionnaire, as the survey firm requires. A total of 9000 questionnaires were sent to minicomputer users. Motorola/Four Phase Systems, Inc. was also eliminated from this year's survey because, a spokesman said, Datapro felt Four-Phase was no longer a major contender in the minicomputer market.

The Datapro survey, "User Ratings of Computer Systems," costs \$29 and is available from the company at 1805 Underwood Blvd., Delran, N.J. 08075.

September Report eyes mini issues

Are superminicomputers crowding the main-frame market? Are supermicros encroaching on the minicomputer market? *Computerworld's* Special Report on minicomputers and small business systems will address these and other questions in the September issue.

Article contributions are now being considered for publication in the report. Submissions should take one of two forms: a tutorial article discussing a related issue or trend, or an application story outlining a user's experience with a minicomputer or small business system. The deadline for contributions is July 30.

Articles must be typed, double-spaced and range in length from three to five pages. Artwork and photos are welcome.

Authors should include a brief biography and a telephone number at which they can be reached.

If you have a story you would like to tell or an opinion you would like to express, contact Janet Fiderio, Special Reports Editor, *Computerworld*, 375 Cochituate Road, Box 880, Framingham, MA 01701.

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NEWS

Users rate their minis

Manufacturer and Model	Burroughs Corp. B90	Burroughs Corp. B900	Burroughs Corp. B1900	Data General Corp. Eclipse MV	Datapoint Corp. All models	Digital Equipment Corp. PDP-11	DEC VAX-11/730	DEC VAX-11/750
Survey Item	15	17	100	62	27	114	10	87
Number of User Responses	103	116	113	93	113	125	101	95
Average Life of System (in months)	60.00	70.59	65.00	82.26	85.19	83.33	90.00	70.11
Acquisition Method (%)	20.00	17.65	25.00	0.00	3.70	2.63	0.00	8.05
Purchase	20.00	11.76	9.00	17.74	11.11	14.04	10.00	20.69
Rental or Lease from Manufacturer								
Lease from Third Party								
System Ratings ¹								
Ease of Operation	3.36	3.41	3.53	3.53	3.31	3.41	3.40	3.46
Reliability of System	3.60	3.53	3.48	3.47	3.33	3.51	4.00	3.65
Reliability of Peripherals	3.47	3.47	3.28	3.52	3.41	3.38	3.70	3.57
Manufacturer's Maintenance Service								
Responsiveness	3.33	3.41	3.51	3.53	3.41	3.47	3.70	3.56
Effectiveness	3.13	3.18	3.27	3.31	3.19	3.40	3.70	3.45
Manufacturer's Technical Support								
Troubleshooting	3.33	2.76	2.84	2.98	2.65	3.08	3.11	3.30
Education	3.27	2.82	2.81	2.92	2.46	2.95	3.33	3.15
Documentation	2.67	2.59	2.56	2.70	2.46	2.85	3.00	3.24
Manufacturer's Software								
Operating System	3.13	3.35	3.64	3.48	3.04	3.39	3.70	3.69
Compilers and Assemblers	3.21	3.27	3.40	3.29	3.13	3.20	3.70	3.58
Applications Programs	2.82	2.59	2.83	2.92	2.80	2.98	3.20	3.08
Ease of Programming	3.13	3.00	3.28	3.32	3.26	3.19	3.30	3.44
Ease of Conversion	2.93	2.88	3.26	3.20	2.67	3.03	3.20	3.21
Overall Satisfaction	3.07	3.06	3.34	3.46	3.04	3.27	3.60	3.55
Additional Ratings ¹								
Ease of Expansion	3.36	3.24	3.32	3.63	3.56	3.09	3.80	3.57
Compatibility of Hardware Carried Over from Other Systems	3.00	3.18	2.90	3.29	2.71	3.32	3.56	3.32
Compatibility of Programs/Data Carried Over from Other Systems	2.86	3.06	2.92	3.22	2.50	2.88	3.30	2.99
Power and Energy Efficiency	2.92	3.06	2.94	3.22	3.08	2.71	3.22	3.22
Productivity Aids Help Keep Programming Costs Low	2.42	2.81	2.84	2.87	2.43	2.64	3.13	3.19
Software support delivered by Vendor	2.77	2.65	2.68	2.73	2.44	2.65	3.13	3.14
Keeping Up with and Implementing Vendor Changes to Hardware/Software ²	3.00	3.12	3.03	2.95	2.77	2.77	2.80	3.05
Delivery/Installation of Equipment ³								
Delivery of Required Software ³	2.71	2.88	2.81	2.85	2.88	2.88	2.70	2.78
Did the system do what you expected it to do? (%)								
Yes	100.00	76.47	91.00	95.16	92.59	90.35	100.00	95.40
No	0.00	11.76	5.00	0.00	7.41	3.51	0.00	3.45
Undecided	0.00	11.76	4.00	4.84	0.00	3.51	0.00	1.15
Would you recommend system to another user? (%)								
Yes	73.33	70.59	85.00	95.16	74.07	79.82	100.00	98.85
No	6.67	11.76	4.00	0.00	7.41	13.16	0.00	0.00
Undecided	13.33	17.65	10.00	4.84	18.52	7.02	0.00	1.15

¹ Ratings are from 4.0 to 1.0, with 4.0 high.² Ratings are from 4.0 to 1.0, with 4.0 = very easy and 1.0 = very difficult.³ Ratings are from 4.0 to 1.0, with 4.0 = ahead of schedule and 1.0 = very late.

Manufacturer and Model	Digital Equipment Corp. VAX-11/780	Digital Equipment Corp. VAX-11/785	Harris Corp. All models	Hewlett-Packard Co. HP 250	Hewlett-Packard Co. HP 1000	Hewlett-Packard Co. HP 3000	Honeywell, Inc. DPS 6	IBM Series/1
Survey Item	91	11	7	6	8	174	40	11
Number of User Responses	118	82	113	128	131	100	109	136
Average Life of System (in months)	76.92	90.91	100.00	100.00	100.00	69.54	75.00	90.91
Acquisition Method (%)	5.49	0.00	0.00	0.00	0.00	15.52	5.00	0.00
Purchase	17.58	9.09	0.00	0.00	0.00	13.79	17.50	9.09
Rental or Lease from Manufacturer								
Lease from Third Party								
System Ratings ¹								
Ease of Operation	3.51	3.36	3.57	3.33	2.83	3.49	3.10	3.27
Reliability of System	3.60	3.36	3.29	3.50	3.67	3.71	3.45	3.55
Reliability of Peripherals	3.34	3.55	3.14	3.50	3.33	3.68	3.18	3.55
Manufacturer's Maintenance Service								
Responsiveness	3.43	3.45	3.29	2.83	3.63	3.58	3.30	3.36
Effectiveness	3.36	3.55	3.29	3.00	3.50	3.54	3.20	3.55
Manufacturer's Technical Support								
Troubleshooting	3.16	3.09	3.00	2.80	3.13	3.22	2.82	3.11
Education	3.08	3.11	3.14	2.67	3.25	3.15	2.90	2.80
Documentation	3.16	3.00	2.43	2.83	3.00	2.99	2.77	3.00
Manufacturer's Software								
Operating System	3.57	3.60	3.71	3.17	3.25	3.54	3.07	3.44
Compilers and Assemblers	3.49	3.60	3.43	3.17	3.25	3.41	3.18	3.11
Applications Programs	2.94	2.71	3.00	2.71	2.71	3.00	2.81	3.17
Ease of Programming	3.46	3.22	3.43	3.50	2.75	3.33	2.89	2.89
Ease of Conversion	3.19	2.88	3.43	2.50	2.75	3.37	2.91	2.17
Overall Satisfaction	3.48	3.30	3.29	2.83	2.88	3.47	3.15	3.11
Additional Ratings ¹								
Ease of Expansion	3.61	3.73	3.29	3.20	3.29	3.61	3.44	3.45
Compatibility of Hardware Carried Over from Other Systems	3.41	3.55	3.00	2.25	2.43	3.00	3.03	3.11
Compatibility of Programs/Data Carried Over from Other Systems	3.21	3.44	3.29	2.00	2.29	3.16	2.79	2.38
Power and Energy Efficiency	3.14	3.40	3.29	2.33	3.14	3.20	3.03	3.11
Productivity Aids Help Keep Programming Costs Low	3.11	3.44	2.86	3.20	2.57	3.07	2.58	3.00
Software Support Delivered by Vendor	2.85	3.11	2.86	2.00	3.14	3.09	2.49	3.00
Keeping Up with and Implementing Vendor Changes to Hardware/Software ²	3.07	3.00	3.29	3.00	2.71	3.29	2.87	3.10
Delivery/Installation of Equipment ³								
Delivery of Required Software ³	2.81	2.73	3.00	2.60	2.88	3.10	2.92	2.91
Did the system do what you expected it to do? (%)								
Yes	95.60	90.91	95.71	83.33	100.00	95.40	90.00	81.82
No	0.00	0.00	0.00	0.00	0.00	1.72	7.50	0.00
Undecided	4.40	9.09	14.29	16.67	0.00	2.87	2.50	9.09
Would you recommend the system to another user? (%)								
Yes	87.91	63.64	100.00	66.67	87.50	94.83	90.00	81.82
No	2.20	0.00	0.00	33.33	12.50	1.15	2.50	9.09
Undecided	9.89	27.27	0.00	0.00	0.00	4.02	7.50	9.09

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YOU MUST ANSWER THESE QUESTIONS TO QUALIFY FOR THE PROFESSIONAL RATE

1. BUSINESS/INDUSTRY (Circle One)

- 10 Manufacturer (other than computer)
20 Finance/Insurance/Real Estate
30 Medicine/Law/Education
40 Wholesale/Retail Trade
50 Business Service (except DP)
60 Government—State/Federal/Local
70 Mining/Construction/Petroleum/Refining
80 Other User

Endors

- 80 Manufacturer of Computers, Computer-related
Systems or Peripherals
85 Computer Service Bureau/Software/Planning/
Consulting
90 Computer/Peripheral Dealer/Distributor/Retailer
95 Other Vendor

2. OCCUPATION/FUNCTION (Circle One)

- 11 VP/Assistant VP
- 12 President/Owner/Partner/General Manager
- 13 Treasurer/Controller/Financial Officer
- 14 Director/Manager/Supervisor DPMIS Services
- 21 Director/Manager of Operations/Planning/ Administrative Services
- 23 Systems Manager/Systems Analyst
- 31 Manager/Supervisor Programming
- 32 Programmer/Methods Analyst
- 35 QA/VP Director/Manager/Supervisor Data Comm Network/Systems Mgmt
- 41 Eng./Scientific/R&D/Tech Mgmt
- 51 Mgt Sales Reps/Sales/Marketing Mgmt Consulting Mgmt
- 60 Consulting Mgmt
- 70 Medical/Legal/Accounting Mgmt
- 80 Educator/Journalist/Librarian/Student
- 90 Other

3. COMPUTER INVOLVEMENT (Circle all that apply)

Types of equipment with which you are personally involved either as user, vendor or consultant

- A. Mainframes/Superminis
- B. Minicomputers/Small Business Computers
- C. Microcomputers/Desktops
- D. Communications Systems
- E. Office Automation Systems

COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

CIRCULATION DEPT., BOX 1016, SOUTHEASTERN, PA 19398-9984

Users rate their minis

NEWS

Manufacturer and Model	Survey Item	IBM System/34	IBM System/36	IBM System/36	McDonnell Douglas Automation Co. (McDonnell, Inc.) Really	McDonnell Douglas Automation Co. (McDonnell, Inc.) Sequel	NCR Corp. 1-9050	NCR Corp. 9300	Parkinson Corp. All models
	Number of User Responses	131	198	149	15	10	25	42	24
	Average Life of System (in months)	12.0	8.8	9.9	12.7	7.5	10.3	9.2	9.8
	Acquisition Method (%)								
	Purchase	77.86	69.70	73.83	86.67	90.00	60.00	66.67	87.50
	Rental or Lease from Manufacturer	9.92	10.61	7.38	0.00	0.00	24.00	16.67	8.33
	Lease from Third Party	10.69	18.69	18.79	13.13	10.00	16.00	14.29	4.17
	System Ratings ¹								
	Ease of Operation	3.44	3.58	3.48	3.60	3.70	3.48	3.71	3.00
	Reliability of System	3.75	3.83	3.82	3.60	3.40	3.28	3.83	3.58
	Reliability of Peripherals	3.65	3.65	3.57	3.40	3.20	3.28	3.59	3.08
	Manufacturer's Maintenance Service								
	Responsiveness	3.42	3.42	3.51	3.57	3.00	3.46	3.43	3.29
	Effectiveness	3.47	3.50	3.58	3.36	2.90	3.21	3.49	2.95
	Manufacturer's Technical Support								
	Troubleshooting	3.07	3.13	3.16	3.27	2.60	2.96	3.19	2.76
	Education	3.05	3.12	3.17	3.00	2.50	2.76	3.21	2.76
	Documentation	3.13	3.10	3.19	3.20	2.60	2.56	2.93	2.39
	Manufacturer's Software								
	Operating System	3.39	3.51	3.64	3.67	3.67	3.16	3.48	2.91
	Compilers and Assemblers	3.38	3.45	3.57	3.55	3.67	3.28	3.54	2.95
	Applications Programs	2.92	2.99	2.96	3.00	2.88	2.63	2.91	2.39
	Ease of Programming	3.18	3.31	3.61	3.31	3.89	3.24	3.21	3.09
	Ease of Conversion	3.00	3.40	2.74	3.44	3.44	2.88	3.47	3.04
	Overall Satisfaction	3.28	3.47	3.54	3.54	3.67	3.08	3.56	3.00
	Additional Ratings ¹								
	Ease of Expansion	3.10	3.51	3.74	3.79	3.60	3.44	3.74	3.21
	Compatibility of Hardware	2.75	3.19	2.88	3.09	3.00	3.00	3.31	2.86
	Carried Over from Other Systems	2.71	3.17	2.51	3.18	2.90	3.04	3.46	2.90
	Compatibility of Programs/ Data Carried Over from Other Systems	2.96	3.33	3.24	3.36	3.20	2.87	3.49	3.27
	Power and Energy Efficiency	2.89	3.13	3.62	3.15	3.20	2.56	2.79	2.54
	Productivity Aids Help Keep Programming Costs Low	2.83	3.02	3.17	2.92	2.63	2.42	2.92	2.52
	Software Support Delivered by Vendor	3.12	3.24	3.19	3.43	3.00	3.08	3.13	2.80
	Keeping Up with and Implementing Vendor Changes to Hardware/Software ²	3.01	3.03	2.97	3.00	3.00	2.80	2.88	2.83
	Delivery/Installation of Equipment ³	2.99	3.05	3.04	2.71	3.00	2.92	3.05	2.74
	Delivery of Required Software ³								
	Did the system do what you expected it to do? (%)								
	Yes	93.13	95.45	93.96	93.33	80.00	92.00	92.86	87.50
	No	4.58	2.53	2.68	6.67	20.00	4.00	0.00	12.50
	Undecided	2.29	2.02	3.36	0.00	0.00	4.00	4.76	0.00
	Would you recommend the system to another user? (%)								
	Yes	85.50	96.97	97.99	93.33	90.00	84.00	95.24	83.33
	No	9.92	0.50	0.00	6.67	10.00	8.00	0.00	8.33
	Undecided	2.29	2.53	2.01	0.00	0.00	8.00	0.00	8.33

DATAPRO RESEARCH CORP. CHARTS

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³ Ratings are from 4.0 to 1.0, with 4.0 = ahead of schedule and 1.0 = very late.

NEWS

Users rate the vendors

DATAPRO RESEARCH CORP. CHARTS

Manufacturer	Burroughs Corp.	Data General Corp.	Datapoint Corp.	Digital Equipment Corp.	Harris Corp.	Hewlett-Packard Co.	Honeywell, Inc.	IBM	McDonnell Douglas Automation Co. (Microdata, Inc.)	NCR Corp.	Perkin-Elmer Corp.	Prime Computer, Inc.	Sperry Corp.	Tandem Computers, Inc.	Texas Instruments, Inc.	Wang Laboratories, Inc.	
Survey Item	132	62	27	313	7	188	40	489	25	67	24	150	35	12	12	88	31
Number of User Responses																	
Average Life of System (in months)	11.3	9.3	11.3	11.3	11.3	10.3	10.9	10.1	10.6	9.6	9.8	10.7	9.9	10.3	10.9	11.3	10.3
Acquisition Method (%)																	
Purchase	65.15	82.26	85.19	78.27	100.00	71.81	75.00	73.62	88.00	64.18	87.50	66.00	51.43	66.67	75.00	69.32	67.74
Rental or Lease from Manufacturer	23.48	0.00	3.70	4.79	0.00	14.36	5.00	9.20	0.00	19.40	8.33	24.67	37.14	0.00	0.00	12.50	12.90
Lease from Third Party	10.61	17.74	11.11	16.61	0.00	12.77	17.50	16.36	12.00	14.93	4.17	8.67	11.43	33.33	25.00	18.18	19.35
System Ratings ¹																	
Ease of Operation	3.50	3.53	3.31	3.45	3.57	3.46	3.10	3.50	3.64	3.62	3.00	3.46	2.84	3.55	3.42	3.69	3.42
Reliability of System	3.50	3.47	3.33	3.59	3.29	3.71	3.45	3.80	3.52	3.62	3.58	3.65	3.13	3.91	3.58	3.55	3.52
Reliability of Peripherals	3.33	3.52	3.41	3.44	3.14	3.66	3.18	3.62	3.32	3.47	3.08	3.37	2.87	3.64	3.55	3.38	3.42
Manufacturer's Maintenance Service																	
Responsiveness	3.48	3.53	3.41	3.49	3.29	3.56	3.30	3.45	3.33	3.44	3.29	3.31	3.29	3.73	3.83	3.20	3.52
Effectiveness	3.24	3.31	3.19	3.42	3.29	3.52	3.20	3.52	3.17	3.38	2.95	3.13	3.00	3.64	3.92	3.14	3.45
Manufacturer's Technical Support																	
Troubleshooting	2.89	2.98	2.65	3.17	3.00	3.20	2.82	3.12	3.00	3.10	2.76	2.88	2.57	3.18	3.36	2.70	3.10
Education	2.86	2.92	2.46	3.06	3.14	3.14	2.90	3.11	2.80	3.04	2.76	2.83	2.15	3.36	3.09	2.73	2.76
Documentation	2.58	2.70	2.46	3.06	2.43	2.98	2.77	3.14	2.96	2.79	2.39	2.69	2.29	3.09	2.83	2.57	2.67
Manufacturer's Software																	
Operating System	3.54	3.48	3.04	3.54	3.71	3.52	3.07	3.51	3.67	3.36	2.91	3.50	3.09	3.67	3.80	3.36	3.28
Compilers and Assemblers	3.37	3.29	3.13	3.43	3.43	3.39	3.18	3.46	3.60	3.44	2.95	3.20	3.18	3.50	3.44	3.38	3.24
Applications Programs	2.78	2.92	2.80	2.99	3.00	2.95	2.81	2.97	2.94	2.80	2.39	2.76	2.22	3.30	3.10	2.89	3.00
Ease of Programming	3.23	3.32	3.26	3.35	3.43	3.31	2.89	3.36	3.55	3.22	3.09	3.40	2.86	3.17	3.44	3.64	3.21
Ease of Conversion	3.17	3.20	2.67	3.13	3.43	3.32	2.91	3.08	3.44	3.25	3.04	3.21	2.91	3.10	3.11	3.34	3.12
Overall Satisfaction	3.27	3.46	3.04	3.42	3.29	3.42	3.15	3.44	3.59	3.38	3.00	3.35	2.83	3.58	3.60	3.38	3.28
Additional Ratings ¹																	
Ease of Expansion	3.32	3.63	3.56	3.42	3.29	3.58	3.44	3.47	3.71	3.63	3.21	3.70	3.21	3.92	3.27	3.57	3.35
Compatibility of Hardware Carried Over from Other Systems	2.95	3.29	2.71	3.36	3.00	2.96	3.03	2.98	3.05	3.19	2.86	3.30	2.58	3.27	2.90	2.73	3.04
Compatibility of Programs/Data Carried Over from Other Systems	2.94	3.22	2.50	3.04	3.29	3.09	2.79	2.84	3.05	3.30	2.90	3.02	2.94	2.89	3.00	3.11	2.87
Power and Energy Efficiency	2.95	3.22	3.08	3.02	3.29	3.18	3.03	3.20	3.29	3.27	3.27	3.07	2.78	3.17	3.36	3.13	3.10
Productivity Aids Help Keep Programming Costs Low	2.80	2.87	2.43	2.97	2.86	3.06	2.58	3.22	3.17	2.70	2.54	2.80	2.38	3.00	3.11	3.51	2.87
Software Support Delivered by Vendor	2.69	2.73	2.44	2.87	2.86	3.06	2.49	3.02	2.81	2.73	2.52	2.68	2.40	2.83	3.10	2.67	2.86
Keeping up with and Implementing Vendor Changes to Hardware/Software ²	3.04	2.95	2.77	2.94	3.29	3.26	2.87	3.19	3.00	2.85	2.83	3.02	2.80	3.00	2.83	2.71	3.16
Delivery/Installation of Equipment ³	2.81	2.85	2.88	2.82	3.00	3.08	2.92	3.00	3.25	3.11	2.80	2.97	2.60	3.25	3.42	3.02	3.17
Delivery of Required Software ³	2.86	2.98	2.83	2.84	2.86	3.01	2.79	3.03	2.83	3.00	2.74	2.89	2.83	2.92	2.83	2.73	3.07
Did the system do what you expected it to do? (%)																	
Yes	90.15	95.16	92.59	93.61	85.71	95.21	90.00	94.07	88.00	92.54	87.50	89.33	74.29	100.00	91.67	94.32	93.55
No	5.30	0.00	7.41	2.24	0.00	1.60	7.50	3.07	12.00	1.49	12.50	5.33	14.29	0.00	8.33	3.41	3.23
Undecided	4.55	4.84	0.00	3.19	14.29	3.19	2.50	2.66	0.00	4.48	0.00	4.67	11.43	0.00	0.00	1.14	0.00
Would you recommend system to another user? (%)																	
Yes	81.82	95.16	74.07	87.54	100.00	93.62	90.00	93.87	92.00	91.04	83.33	89.33	65.71	91.67	83.33	92.05	87.10
No	5.30	0.00	7.41	5.43	0.00	2.66	2.50	3.07	8.00	2.99	8.33	8.00	14.29	0.00	0.00	0.00	9.68
Undecided	11.36	4.84	18.52	6.71	0.00	3.72	7.50	2.45	0.00	2.99	8.33	2.67	20.00	8.33	8.33	7.95	0.00

¹ Ratings are from 4.0 to 1.0, with 4.0 high.² Ratings are from 4.0 to 1.0, with 4.0 = very easy and 1.0 = very difficult.³ Ratings are from 4.0 to 1.0, with 4.0 = ahead of schedule and 1.0 = very late.

NEWS



CALENDAR

WEEK OF AUGUST 18

AUGUST 18-23, DALLAS — Systems Development: Information Modeling. Contact: Arthur Young & Co., Arthur Young Education Center, 1950 Roland Clarke Place, Reston, Va. 22091.

AUGUST 18-23, LOS ANGELES — The International Joint Conference on Artificial Intelligence. Contact: Claudia Mazzetti, American Association for Artificial Intelligence, 445 Burgess Drive, Menlo Park, Calif. 94025.

AUGUST 19-20, BOSTON — Data Communications II: Digital Communications Systems. Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

AUGUST 19-20, DETROIT — Information Centers: End User Computing. Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810.

AUGUST 19-20, HASBROUCK HEIGHTS, N.J. — Unix/Xenix. Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705. Also being held Aug. 21-22 in Hartford, Conn.; Aug. 26-27 in St. Louis; and Aug. 28-29 in Philadelphia.

AUGUST 19-20, PORTLAND, ORE. — Principles of Prototyping. Contact: Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138. Also being held Aug. 22-23 in Calgary, Alta.

AUGUST 19-21, NEW YORK — SAS Computer Performance Evaluation Course. Contact: SAS Institute, Inc., Box 8000, SAS Circle, Cary, N.C. 27511.

AUGUST 19-21, NEW YORK — Telecommunications Management. Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

AUGUST 19-22, SAN ANTONIO — Vsam: Its Structure and How to Use It. Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held Aug. 26-29 in Fort Lee and Los Angeles.

AUGUST 19-22, SAN FRANCISCO — Data Base Development Workshop. Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop W., Houston, Texas 77092.

AUGUST 19-23, PHILADELPHIA — Advanced Systems Analysis. Contact: Thomas J. Bisacquino, Director of Education, Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138.

AUGUST 20, NEW YORK — CICS/VS Application Design. Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held Aug. 22, 27 and 29 in New York; and Aug. 26-29 in Denver.

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Garry St., Santa Ana, Calif. 92705. Also being held Aug. 26-28 in Montreal.

AUGUST 21-23, BOSTON — Data Base Administration and Data Resource Development. Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810. Also being held Sept. 11-13 in Dallas.

AUGUST 21-23, CARY, N.C. — SAS Operations Research Course. Contact: SAS Institute, Inc., Box 8000, SAS Circle, Cary, N.C. 27511.

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WEEK OF AUGUST 25

AUGUST 25-30, DALLAS — Systems Development: Design Phase.

Contact: Arthur Young & Co., Arthur Young Education Center, 1950 Roland Clarke Place, Reston, Va. 22091.

AUGUST 26-27, SAN ANTONIO — CICS/VS Performance and Tuning. Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

AUGUST 26-28, PARSIPPANY, N.J. — Vsam in Cobol. Contact: Chubb Institute, P.O. Box 342, 8 Sylvan Way, Parsippany, N.J. 07054.

AUGUST 26-29, FORT LEE, N.J. — IMS/DB (DL/1) Application Programming. Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

AUGUST 26-29, SAN FRANCISCO — Integrated Information Technology Conference and Exposition (Intech '85). Contact: Jill Nieman,

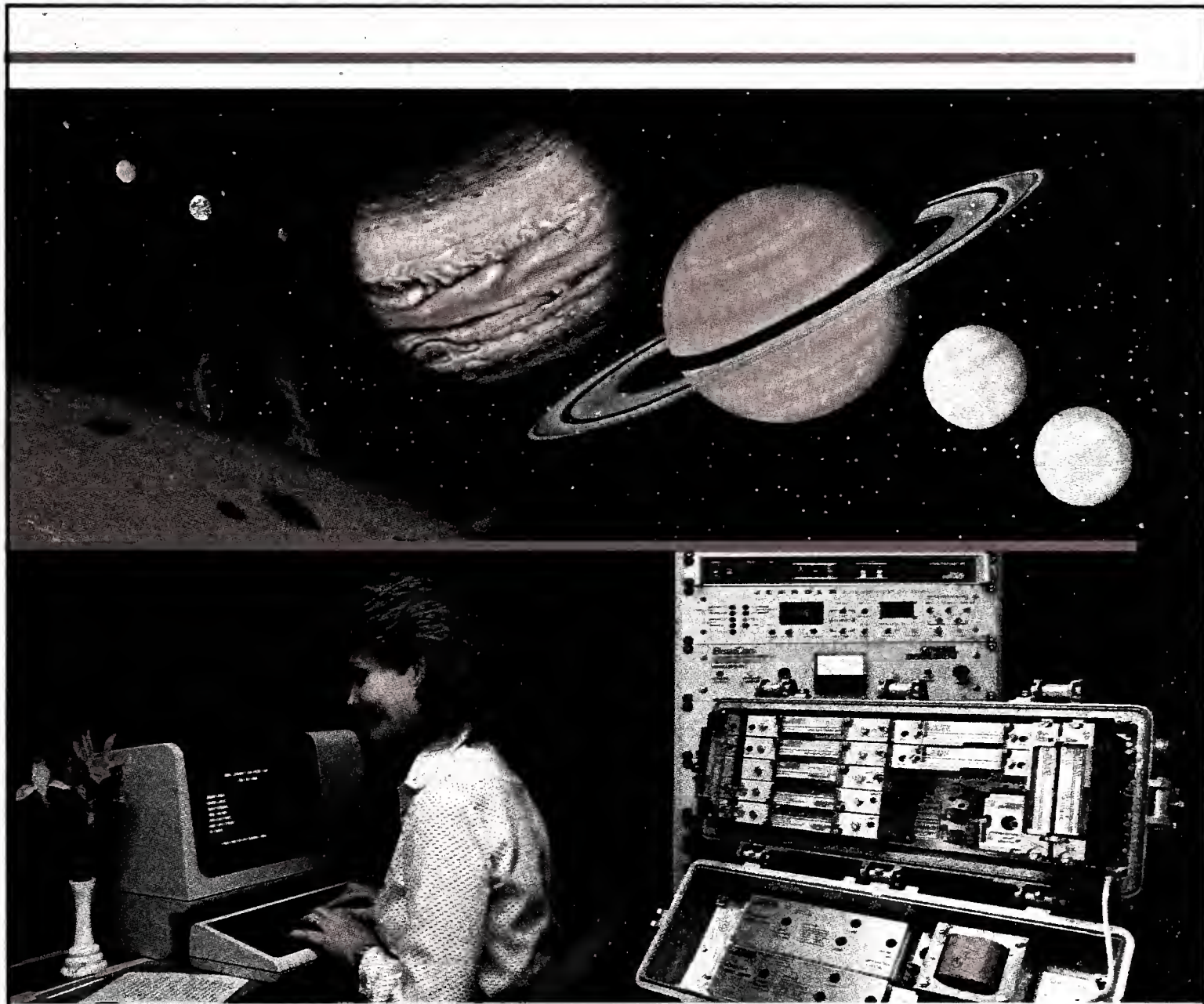
National Trade Productions, Inc., 2111 Eisenhower Ave., Alexandria, Va. 22134.

AUGUST 26-30, HOUSTON — Analysts' Skills Workshop. Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop W., Houston, Texas 77092.

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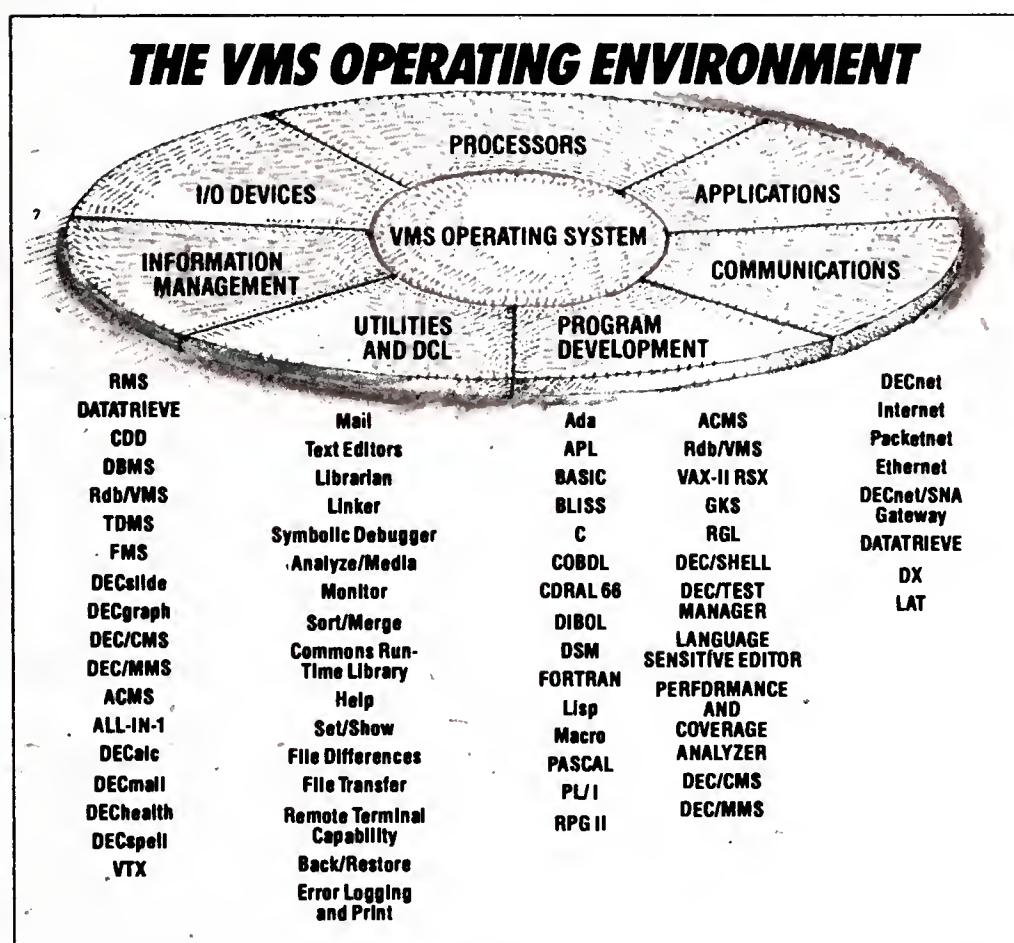
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EDITORIAL

Whale watching

Call me Ishmael.

I'm vice-president of marketing with a major mainframe applications software vendor. For the past few years, I've spent more time than I care to total, grappling with this great white whale known to people everywhere as the "Major Computer Trade Show."

National Computer Conference, Comdex — whatever their proper names, they are big and buoyant. I have enjoyed the hunt, but now I hear dire warnings that the breed may be nearing extinction.

The demise of the major computer trade show has been predicted at least since the Houston Horrors of 1983 and the time when Comdex became a bigger Las Vegas draw than Liberace. When things become large and powerful, people tend to enjoy taking easy shots at them, which helps explain pursuits such as whale hunting or the moose season in New Hampshire.

Frankly, the computer industry should be little alarmed and marginally concerned by the fact that the erstwhile trade show titans no longer draw the numbers of exhibitors they once did. It is a sign of industry maturity and enhanced user sophistication that both forces are responding to real problems with real solutions by using the trade show medium to advance the information management revolution.

Some vendors see a horizontal show like NCC or Comdex as a perfect vehicle for dealing with OEMs, value-added resellers and retailers with multiple-product needs; others prefer the vertical technology- or application-focused shows, having come to grips with the ego-bruising reality that not every computer-related product is ideal for every business computer user.

Maturity and sophistication can be as becoming to technologies as to people. I was in Chicago for NCC last week. I came back with some meat and some blubber. Exhibitor ranks were reduced.

Maybe they were, compared to the halcyon years of 1983 and 1984. But compared with those days, *everything* about the computer industry is now subdued. This NCC was good for some vendors, not good for others. Next year, the latter may go somewhere else, or go nowhere at all.

One of the appealing facets of the computer industry is its absence from arbitrary (read: government) restraints and its quicksilver response to freewheeling market forces — just as whale hunters respond instantaneously to forces of nature.

So, call me Ishmael. Or maybe Pollyanna?



'So I didn't do too well with three — Let's see how I do with four!'

LETTERS

Roadblocks to relational DBMS

In the article, "Symposium panel fields DBMS questions," [CW, June 24] its author, George Schusel, attributed to me the statement that "born-again" DBMS, including IDMS/R, Datacom DB and TIS are *not relational*. As a report of what I said, this is largely incorrect.

I stated that the present release of Cullinet Software, Inc.'s IDMS/R is not relational, but I did not make any such description of Applied Data Research, Inc.'s (ADR) Datacom DB or of Cincom Systems, Inc.'s TIS or of born-again DBMS in general.

What I did say about the born-again DBMS was that, so long as they continue to allow data base access via their lower level languages, there would be a serious problem: Users of these lower level languages would be able to subvert many integrity

constraints specified in the higher level relational languages.

This means that ADR's combination of Ideal and Datacom DB or Cincom's TIS cannot become fully relational unless and until the vendors of these products solve the integrity subversion problem in addition to supporting any functions from the relational model not yet implemented.

The assertion that many of these points are only of academic interest reminds me of nontechnical criticisms of earlier years, especially the one: "The relational model is a religion." Such criticisms are usually made by people who have little or no understanding of the relational model.

E. F. Codd
San Jose, Calif.

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VIEWPOINT

Resting on the laurels of American technology



**LECHT
ON SCIENCE**
Charles P. Lecht

I had begged off accompanying my friends through the American Pavilion at Japan's International Exposition at Tsukuba (Tsukuba Expo '85) by saying that I had already toured it on several occasions, was tired and would prefer to wait out their visit at a nearby coffee shop. While all this was indeed true, I did *not* tell them that the main reason for my reluctance to revisit our national pavilion was that I find the exhibit depressing. The picture of American science that it presents, in comparison with what can be found elsewhere at the fair, is more Stone Age than Space Age.

Tsukuba Expo '85 is a fair dedicated to help further understanding of the benefits brought to humanity by today's scientific achievements. It is also an expression of our hopes and aspirations for what these benefits might bring to tomorrow's world.

The expo's theme is "Dwellings and Surroundings — Science and Technology for Man at Home," and its participants include more than 47 foreign countries, 37 international organizations and 28 domestic (Japanese) corporations. The exhibits sprawl over 252 acres, making it the largest science fair of its kind.

During the expo's first four weeks, four million people visited the fairgrounds — indicating that the forecasted attendance of 20 million is certain to be exceeded before the show closes in mid-September. The expected attendance at the U.S. pavilion is sure to exceed five million, and I wouldn't be surprised if it approached 10 million — most visitors are intensely curious as to what the country that put a man on the moon is up to these days.

Lecht is chairman of Lecht Sciences, Inc., a New York-based think tank specializing in computer and communications technologies.

Before I first visited the fair, I was certain that our national pavilion would be the finest one there. In view of our yelling "foul" at Japan over its international trade practices in computer and communications systems, could there be any doubt that we'd do anything less than our best to win a gold medal at a scientific olympics and thus substantiate our case in front of the world scientific community? Tsukuba Expo '85 presented an excellent opportunity for America to put on a high-quality performance to help prove its case.

So what did we do? We created a pavilion that is so awful that one foreign friend suggested that it appeared to be the "child of an American-hating saboteur bent on destroying our world-renown space-age scientific image. The outer pavilion is a tent-like structure whose message is a dedication to days of yore and gore when men proved their masculinity by bashing each other, and damsels had ample cause to be in distress."

But, if the exterior of our national pavilion is sad, what's inside is enough to make a patriotic citizen weep.

In addition to official government showpiece exhibitions, presumably sponsored by the U.S. Department of Commerce, it houses a cluster of American corporate exhibits from the likes of DuPont Co., Polaroid Corp., Texas Instruments, Inc., Digital Equipment Corp. and Thompson Ramo-Woolridge, to name a few of the 40 U.S. companies said to have supported our pavilion.

Yuppies on vacation

Manned by what appears to be yuppies on vacation, the exhibits are laid out in a manner reminiscent of Tokyo's Akihabara [CW, May 13 and May 27]. They are strewn about as though our pavilion's planners hadn't been given a hint that they were creating a space-age science show dedicated to the future.

Consequently, the designers have created a disorganized, tasteless mess of scientific paraphernalia, some of which may qualify for space-age antiquity (circa 1960). Adding insult to injury, some are annotated by claims to their invention by a bearded bevy of dead Nobel Prize laureats — indeed, the

pavilion sports a touch-sensitive monitor dedicated to the lives and works of America's 133, which would have been great had Expo '85 been a historical event.

After promising a journey through the world's foremost achievements in artificial intelligence, the exhibits — amazingly — take visitors back in time so that they may learn of American contributions to the origins of this important science without suggesting what it may hold for the future. Missing is any kind of solid statement about the future of robotics, medicine, agriculture, energy and so on as found in the Japanese government's pavilion. Posters and jazzy displays featuring photographs and ill-conceived graphics surround an occasional hard-wired push-the-button-and-watch-the-lights diagram similar to what one might expect at a high school science fair.

Show is mindless

The 12-minute show, titled "To think" is mindless. Our pavilion offers a sorry statement of accomplishments in science in a world enjoying a scientific renaissance brought about by American ingenuity. Not that it says *nothing*, but when a country is supposedly No. 1, the public rightly expects something more.

My biggest fear is that, in the absence of anything as substantial in our national pavilion, visitors may wonder whether America's competitiveness hasn't been replaced by a contentment to rest on our laurels.

Whether we've been so busy yelling "foul" at any and every nation that's out there hustling, we seem not to have taken the time to notice that other nations may be making real progress in science and may well be catching up. The U.S. will have to do much better than it has done at Tsukuba Expo '85 next time around, or we'll give foreign competitors a big assist by sending potential customers elsewhere.

I sit awaiting my friends. On their arrival, I know that I am not alone in my feelings. They express their own dismay by saying, "We now know why you begged off. The show was senseless, and the sole American robot in it was out to lunch."

Certification: a gauge for computer professionals?



READER'S PLATFORM
Robert R. Cromer

With so many corporations and DP shops reporting positive experience with certified computer professionals during the past few years, it's about time for the antiprofessionalism faction to have its say.

Especially remarkable is the claim that certification does not even make the list when hiring entry-level people. In fact, there is no such thing as an entry-level certified data processor or computer programmer.

As for other negative attitudes reported by researchers, any of those interviewed may have — with or without their knowledge — had contact with "closet" certified data processors or computer programmers within their organizations.

Cromer is the education director for the Data Processing Management Association Special Interest Group for Certified Data Processors.

One of the best-kept secrets within the computer information systems community is the plethora of tales told about erstwhile competent, productive staff members suddenly becoming incompetent upon discovery of their certification. The only change was knowledge of an individual's status by coworkers and supervisors.

Home-grown testing

With regard to implications that an organization's home-grown testing better indicates an applicant's potential productivity within the shop than does industry certification, the claim may be correct — if the search is for technical specialists rather than for knowledgeable professionals.

From the availability viewpoint, "fast-fingered Franks and Frankies" outnumber practicing certified professionals by 95 to one.

The purpose of the Institute for the Certification of Computer Professionals (ICCP) continues to identify those individuals who are truly knowledgeable, responsible and professional. In support of this purpose — and consistent with its character

— the Data Processing Management Association Special Interest Group for Certified Data Processors produces a complete, knowledge-based, review course package.

Used by colleges and universities, corporations and local ICCP chapters, the "Uniform Review Course" material is consistent with the knowledge level of certified data processor candidates with a master's degree in MIS. Remarks from those who present the review course "in the field" suggest that even certified data processor candidates who find themselves unsuccessful in the certification effort claim greater respect for the breadth and depth of the subject covered in the review and tested in the exam.

For companies and individuals — whose hiring practices continue to discriminate against certified computer professionals — the self-fulfilling prophecy will continue. They are unlikely to encounter many resumes that identify the applicant as a certificate holder and are unlikely to discover a certified data processor or computer programmer within the organization until just before or after the certificate holder's departure.

Such is the case where an inability — or unwillingness — to distinguish between technician and professional persists.

Advertisements with disclaimers

I suggest that organizations that choose to avoid interviewing or employing industry-certified computer professionals do so by qualifying their recruitment specifications and advertisements with the disclaimer: "Industry certification *not* recognized here." In fact, I urge such a practice for organizations whose internal and public financial policies and practices may be in conflict with public perceptions of privacy or with the law.

Because of the certificate holders' ethical and legal obligations, they are automatically placed in jeopardy when employed by organizations whose policies and practices cannot tolerate close scrutiny.

For those organizations seeking to employ the best-qualified, professional people — and for those that wish to include certified computer professionals — I suggest that properly identify themselves in recruitment specifications and advertising. ‡

VIEWPOINT

DP employers on the wrong track with job histories



READER'S PLATFORM

John Callahan

A major factor that potential employers rely upon is an applicant's job history — labeled most often as the track record. The very term denotes a race that can be objectively evaluated as though one were racing a measured distance, being checked at various checkpoints against a stopwatch.

This a false concept. Applicants are not animals in a race nor are they runners in a track meet. Yet these false analogies carry over into the

working world where they prevail as accepted standards. Falsely premised, however, are the assumptions of that standard.

Just as machines, sprinters and racehorses can be measured against a clock, so, too, people are measured by their work histories against some kind of clock.

Those applicants who have reached a certain job level within a certain time frame are considered to be the winners — and all companies want winners. Those who have failed to attain the proper level within the time frame are the losers. The company management would never consider interviewing people like that, let alone hire them.

Never mind that many companies today are in deep financial trouble facing the prospects of bankruptcy. Yes, just continue to ignore the mass evidence in DP, showing that DP is for the most part in a sorry state in spite of all the super technology changes pouring from the pipelines.

All this sends out a clear message that even the most die-hard theorists arguing in behalf of the track record cannot hide from this evidence: There are serious troubles in data processing in U.S. industry, and the track record as a tool has failed to accomplish the job attributed to it.

In spite of these repeated failures to identify potential employees, personnel department managers and DP

department managers cling to this sacred track record tool.

As a result, the job track record has become enshrined as the major tool for selecting applicants for interviews. It is not difficult to assume that the track record also weighs heavily in the final choice of applicants. So, it has a dual function that compounds the extent of the false premises upon which the track record is founded.

It is a false assumption that top performers can readily find new jobs. Therefore, any applicant who has been unemployed for any extended period is not a top performer, hence not a suitable applicant.

There is a gross failure to recognize that even top performers will work only when economic conditions are favorable. These people must also undertake extensive job searches.

There is the failure to recognize that even top performers are sought out only when there is an existing

”

There is a serious flaw in the assumption that a person with many job changes is an unstable employee.

need by companies for their services. Jobs do not just drop into the applicants' laps. Job searches are the rule — yes, even in data processing — and especially if the applicant is seeking a higher level job.

There is a serious flaw in the assumption that a person with many job changes is an unstable employee.

No track record will ever reveal the factors that motivate an applicant. Job histories do not allow applicants to express what they strongly liked or disliked about particular jobs, nor do they give any indication of the kinds of tasks the applicant enjoys.

DP is a first target for budget reductions. It should not be surprising that unexpected job changes occur within an industry marked with high instability.

Isn't it time to take a hard look at the use of the track record as a major basis for applicant selection? Isn't it time to relegate this tool to an ancillary aid to help balance out applicant selections?

Why not use other means to gather information for applicant evaluation, such as a possible questionnaire that could be mailed to applicants to glean a fuller and clearer picture before meeting with them? Such a questionnaire could identify job tasks and environmental and managerial factors that are strong motivators for an applicant.

If improved conditions in hiring, job stability and productivity are desired, then new means need to be developed to relegate the track record method to its proper ancillary role. It is time to dethrone it and its overbearing importance.

Callahan is an Arlington, Texas-based DP consultant.

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**The time has come
for straight talk about
database management systems.**

"The only reason to buy a database management system is to build better applications."

Throughout the history of the software industry, proponents of one database architecture after another have promoted their respective systems as the sole solution to a company's application backlog problem.

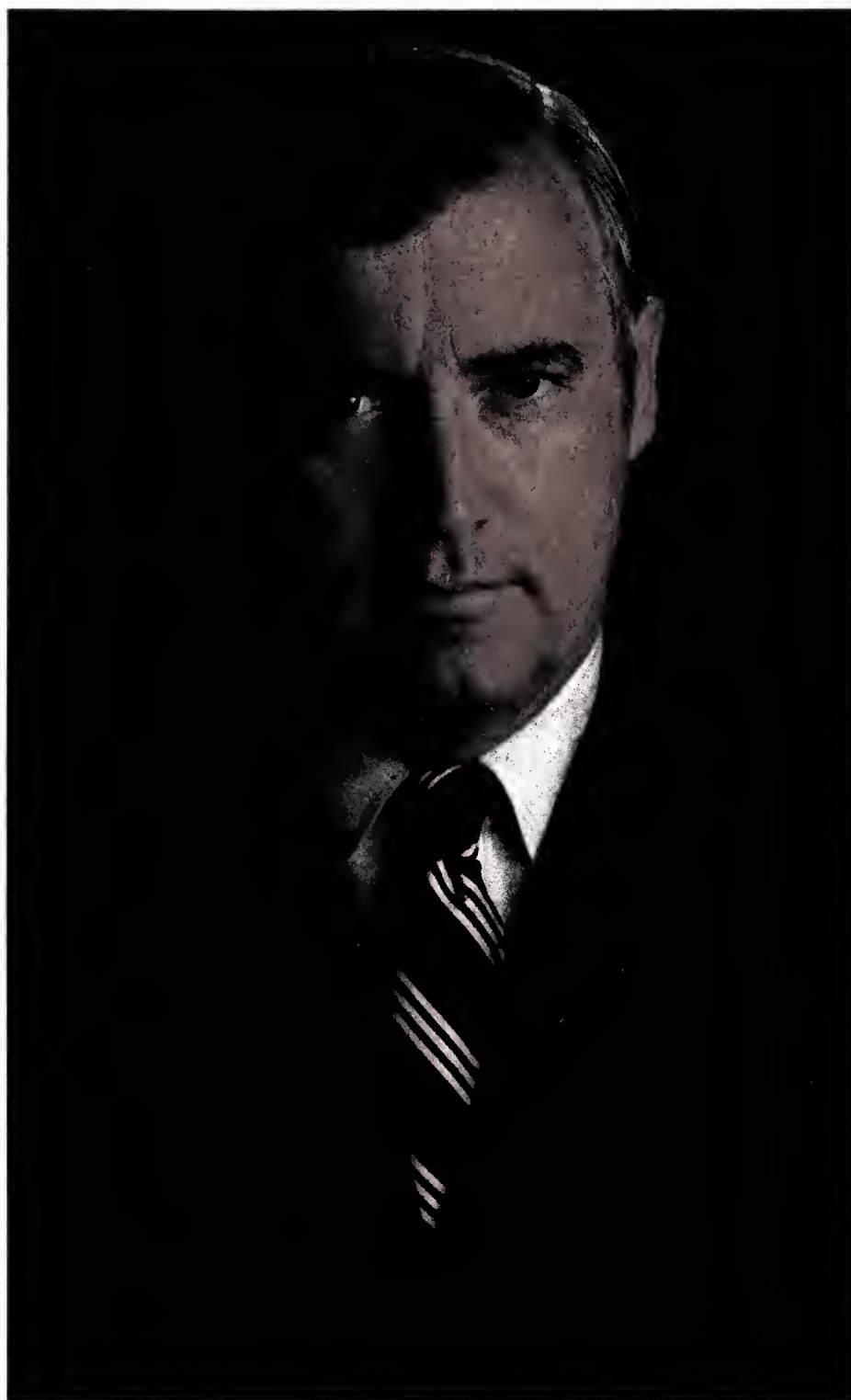
The early debate centered on hierarchical versus network architecture. Advocates of inverted file entered the argument in the 70's. And today, relational is the architecture of choice.

While this discussion about architecture is interesting, it's just not the issue.

Database management systems, beginning with the very first, were created to do one thing and one thing only—they were created to build better applications. *Building applications—efficient, online applications, faster, with fewer people—is the only real issue.*

Today corporations have a huge backlog to contend with. And the applications they need to develop have different characteristics. Some may be retrieval only. Some may be heavy on update. Some will run the company, and will require professional development. Some can be created by end users to satisfy their own needs.

It is extremely important to have a database



management system that can handle all applications. *It is essential* that a database include tools rich and comprehensive enough to accommodate both the professional developer and the end user. It's the richness and power of these tools that's critical to the successful implementation of highly responsive fourth generation applications. What's demanded, in fact, is software that goes a *step beyond* today's conventional relational database systems.

With a comprehensive database management system and the appropriate tools like the kind I'm talking about, you'll make the data processing department a *strategic asset* instead of corporate overhead. You will make your company succeed in a highly competitive world.

In Cullinet's new Annual Report, Presidents and CEO's of major corporations speak about the positive impact Cullinet has had on their operations. For a copy that you might like to read and pass along to your company president, write to me. I'll see that you get one.

John J. Cullinane
Chairman of the Board

The only database management system worth buying is one that meets these six requirements.

Stated simply, IDMS/R is a step beyond today's conventional relational DBMS because it meets these key requirements for building successful applications.

1. **MIS Application Development Facilities**

The application development system required to build high performance production applications requires more than a fourth generation language. Cullinet's ADS/OnLine is a comprehensive application development environment for the MIS professional combining fourth generation language with a menu-driven modular development approach. Integrated with the data dictionary, this minimizes not just the programming but the entire design, development and documentation of an application. Furthermore, this approach produces a dramatic reduction in maintenance and support.

2. **End-User Application Development Facilities**

Because Cullinet recognizes the difference between production and end-user applications, as well as the need for both to share common data, we provide an easy to use end-user oriented development and inquiry system. The Automatic System Facility of IDMS/R is a non-procedural, menu-driven tool designed for end-users. Once data tables are defined, an application is automatically generated. The query facility of IDMS/R provides menu-driven query capability and full online help, so end-users can build working applications in minutes and get reports easily and efficiently.

3. **Relational Architecture**

IDMS/R allows for the definition of databases using the relational data model. Data tables and associated user views are easily defined online. Additionally, any number of key fields may be defined. IDMS/R also supports advanced relational features including referential integrity and domain

definition. This architecture provides the capability to address all application requirements.

4. **High Performance Database and Application Tuning Facilities**

IDMS/R is a full multi-tasking, multi-threaded system providing for concurrent processing of on-line and batch, update and retrieval applications. Additionally, tuning facilities provide efficient indexing techniques, space management, page management, and buffer management. No conventional relational DBMS has these capabilities.

5. **Dictionary Driven DBMS**

Data integrity and data independence are essential in a DBMS environment. The dictionary actively controls the source and use of all data. Data definitions, data validation criteria, data formats and security are all defined within the dictionary and exist only once, eliminating redundancy and ensuring integrity. This information is then automatically used throughout the system. Examples of the functionality of this facility include never needing to define output formats for query; never needing to define field attributes for screens; never needing to code validation and editing criteria when using ADS/OnLine. Only IDMS/R provides this level of dictionary integration.

6. **Open System Architecture**

With the unique Open System Architecture of IDMS/R you can maximize your investment in existing software. IDMS/R accepts data from outside the database environment with direct access to VSAM files. In addition, applications written to access other databases like IMS, DL/I, TOTAL, or VSAM can directly access IDMS/R without modification. IDMS/R is designed to work in virtually all IBM mainframe operating systems and teleprocessing monitor environments.

IDMS/R: More than a relational DBMS

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SOFTWARE & SERVICES

Flexibility key to Bendix' HRMS

By Mitch Betts
CW Washington Bureau

ARLINGTON, Va. — Bendix Aerospace, a unit of Allied Corp., recently developed a human resource management system (HRMS) that puts report generation in the hands of personnel officers, rather than in those of the MIS department.

"We wanted flexibility, and we wanted to enhance the productivity of our personnel people," explained Janie S. Tremlett, manager of human resource systems, in a recent interview here. Consequently, the HRMS is designed to permit the human resource unit's 130 users to create routine and ad hoc reports from the data base.

"This way, you don't have to spend your whole life negotiating between the MIS department and users on a report," Tremlett said.

About three years ago, Bendix Aerospace realized it needed to modernize its 15-year-old, batch-oriented personnel system and began to transform it into an on-line system, Tremlett said. The new HRMS, she said, has three major components:

- The personnel management system and benefit-plan administration system software from San Francisco-based Tesseract Corp., both of which are on-line, interactive systems that allow users to input, update and access data through



Tremlett

customized screens.

- An in-house report library that consists of programs used to produce major administrative reports.

- A facility for ad hoc queries based on Intellect, the natural language query software from Artificial Intelligence Corp. of Waltham, Mass.

Each of the systems has its own security facilities, Tremlett noted, so users have separate passwords for each system.

Tremlett said she requires password changes every 30 days, monitors activity logs and emphasizes security in training sessions and user manuals.

Ron Armstrong, MIS project manager at Bendix Aerospace, praised the Tesseract software for its fast response time. He said response time is between one and three seconds for most searches through the data base of approximately 250,000 records. "It's the most efficient system I've ever seen," Armstrong said of Tesseract.

Armstrong said the Tesseract screens organize information in a logical way, so that all insurance data is presented on one screen, for example.

Tremlett and Armstrong said the company is moving toward a paperless human resource system. The ease-of-use features of Tesseract have helped to wean personnel officers from their traditional paper forms, they said. In addition, the natural language query features of Intellect make the data base more manageable and accessible to novice users.

The HRMS runs on an IBM 3081 mainframe at a data center in Teterboro, N.J., with the CICS teleprocessing monitor and Cullinet Software, Inc.'s IDMS data base management system, according to Armstrong. He added that the Teterboro center

See HRMS page 46

■ Softscope, a compendium of news from the software industry front/**38**

■ Persoft unveiled an expert system designed to support direct marketing efforts/**39**

■ Introduced by Motorola Information Systems, Transtext allows users of the company's minicomputers to communicate with IBM's Disoss/**39**

■ Control Data provided an enhanced version of the UAI/Nastran structural analysis software for its 200 series supercomputers/**39**

■ Nixdorf Computer unleashed a raft of software, including an enhanced release of its Nidos/VSE operating system/**42**

Slump moves to software



SOFTALK
John Gallant
CW Senior Editor

Like a rumor of war, the computer industry slump has finally reached the software heartland.

Accustomed to annual revenue and profit growth in the range of 35% to 50%, software manufacturers are now moderating their optimistic estimates for the year and steeling themselves to deal with delayed — if not canceled — sales and reduced revenues.

How closely early-quarter shortfalls experienced by such companies as Management Science America, Inc. and Applied

Data Research, Inc. are tied to the slump remains to be seen. The software industry is prone to first- and second-quarter doldrums, but any additional problems caused by the slowdown put extra pressure on vendors to make up lost ground at year's end.

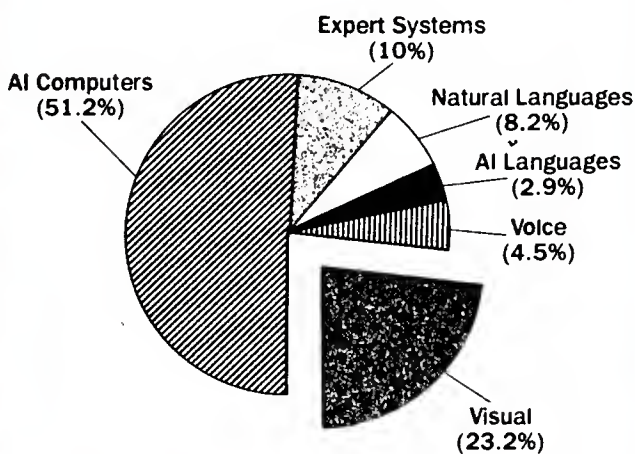
Fortunately, software makers have not had to resort to the severe cost-cutting steps many of their hardware counterparts have already taken. Indeed, there is little evidence thus far that software companies will need to do anything more drastic than tighten their belts for the leaner, though far from desperate, days ahead.

The past months have been euphoric ones for software mak-

See SLUMP page 46

SOFTSPOTS

The 1985 artificial intelligence market (by product area)



Source: DM Data, Inc.

INSIDE

Systems
Software/**42**

Productivity Aids/**44**

Application
Packages/**44**

BIM Spotlight

Wouldn't it be nice to have a couple more terminals on your desk?

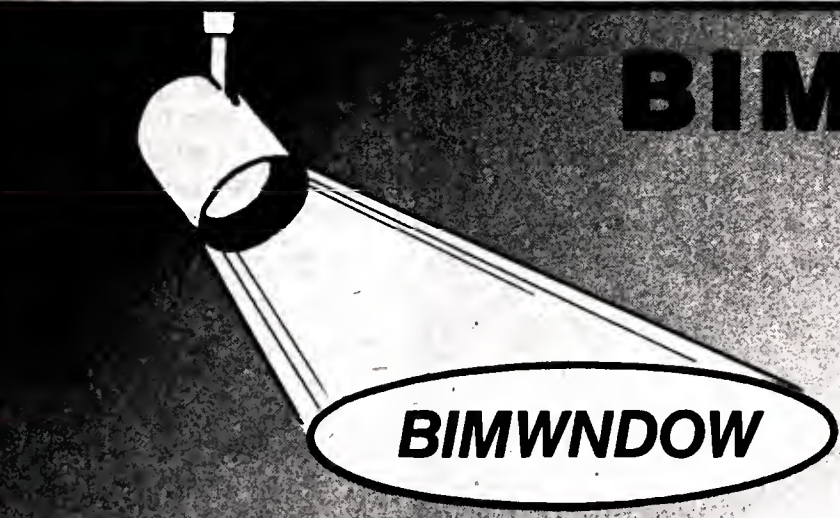
You could eliminate the inconvenience, lost productivity, and system overhead associated with logging off and on to different applications!

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SOFTWARE & SERVICES

SOFTSCOPE

Notes from the software industry front

Software International Corp., in conjunction with General Electric Credit Corp., is providing financing assistance to customers looking to purchase its mainframe and minicomputer applications, including the recently announced Masterpiece series [CW, July 1].

Through GE Credit, Software International will extend credit to help buyers finance their software acquisitions. Andover, Mass.-based Software International is a subsidiary of General Electric Software Products Co.

■ **Digital Equipment Corp. of**

Maynard, Mass., and Information Builders, Inc. have penned a cooperative marketing agreement for the newly unveiled VAX version of N.Y.-based Information Builder's Focus fourth-generation language. The companies will conduct joint product seminars, cooperate in

trade show activities and develop joint marketing support materials.

■ **Pansophic Systems, Inc.** of Oak Brook, Ill., will be investing more than \$1 million in Schonfeld & Associates, Inc. and will expand the marketing of that company's In-

got decision support system, which runs on a variety of mainframes and minis. For its role in the joint marketing and financial agreement with Evanston, Ill.-based Schonfeld & Associates, Pansophic has received an option to acquire certain assets of the company, including the Ingot product line.

■ **In recent weeks, Wang Laboratories, Inc.** of Lowell, Mass., and Nashua, N.H.-based BKW, Inc. have inked two agreements. One is a development pact that calls for BKW to design a series of "banking-related software communications products." The second is a joint marketing agreement that enables Wang to sell BKW's software to banks using Wang hardware.

■ **McLean, Va.-based Verdex Corp.** and Intellimac, Inc. signed an agreement that allows Rockville, Md.-based Intellimac to acquire the source code of the Verdex Ada Development System. Intellimac plans to host and target the Verdex product on both its commercial Ada development processors and its Mil-spec multiprocessor computers.

■ **Motorola/Four Phase Systems, Inc.**, a Cupertino, Calif.-based subsidiary of Motorola, Inc., will be marketing and distributing Software Research Corp.'s Docu-power network software for Four Phase office equipment. The Four Phase version of Natick, Mass.-based Software Research's software will be marketed under the name of Transtext.

■ **Two units of the Schlumberger Computer-Aided Systems Group, Applicon and Factron,** will begin marketing HHB Softron's design evaluation software. Applicon will market HHB Softron's Cadat logic and fault simulation software with its Applicon Bravo very large-scale integrated circuit and Bravo printed-circuit board computer-aided design, engineering and manufacturing systems. Factron will market Cadat as part of its Automated Test Program Generation facility for its line of circuit board testers.

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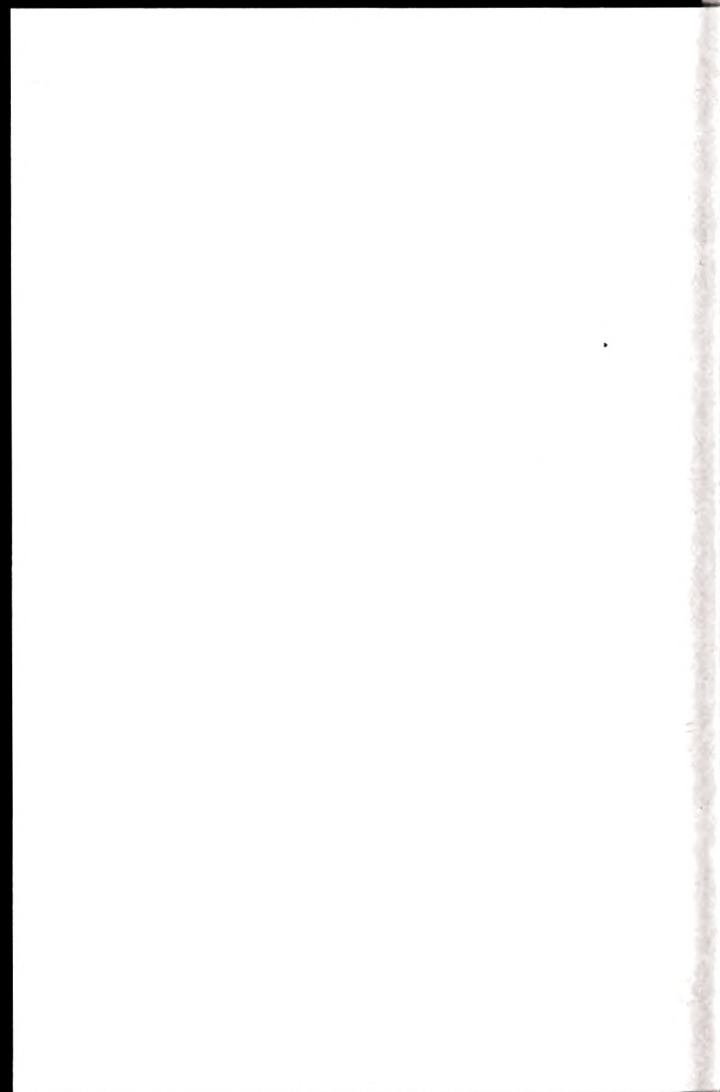
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"It keeps saying it's shut down in honor of Einstein's birthday."





SOFTWARE & SERVICES

Tool identifies potential buyers from mailing list

WOBURN, Mass. — Persoft, Inc. has announced More, an expert system direct marketing tool that identifies potential customers from mailing lists. The package runs in IBM MVS and DOS environments.

Designed for direct mail marketers and service bureaus, the More system includes three modules: list segmentation and selection, decision support with marketing and financial output reports and a data base foundation that maintains list information on individuals.

According to a spokesman, More improves direct mailing responses and reduces mailing costs by selecting the best prospects. The package weighs relevant information about

individuals on a mailing list, considers when the individual last purchased something via direct mail and determines the average purchase amount for an individual, according to the vendor.

The package also reviews how often the individual has responded over a series of mailings and evaluates the type of products the individual has purchased by direct mail. Merchandise return information and other factors are also included in evaluations.

The More package is priced at \$375,000.

More information is available from Persoft, located at 600 W. Cummings Park, Woburn, Mass. 01801.

Motorola, IBM link debuts

CUPERTINO, Calif. — Motorola Information Systems, a division of Motorola, Inc., has introduced Transtext, a program that allows users of its Series 4000/5000 minicomputers to communicate with an IBM Office Systems Network via IBM's Distributed Office Support System (Disoss).

Transtext provides Motorola users with document management capabilities and permits the integration of data files with text. Capabilities for document manipulation, filing, and electronic distribution of documents are also included.

The product consists of software that runs on the host within the IBM network and one of three programs that runs on the Motorola Series 4000 and 5000 systems. The Transtext interface resides on an IBM host running CICS and Disoss Version 3.

Motorola users can transfer documents in native, revisable and final form versions. Transtext Native

Form allows Series 4000 and 5000 users to assemble and transfer Motorola/Four Phase Systems, Inc.'s Foreword word processing documents in native mode to other Series 4000 and 5000 systems in the network.

Transtext Revisable Form allows documents to be exchanged between users where they can be edited and returned to the originator in a form compatible with IBM's revisable form text document architecture. Transtext Final Form allows users to exchange, display and print documents in a form compatible with IBM's final form text document architecture.

The Transtext Interface, Native Form and Final Form are priced from \$800 to \$6,000. Transtext Revisable Form will be available in November and is priced at \$1,500.

More information is available from Motorola Information Systems, located at 10700 N. Deanza Blvd., Cupertino, Calif. 95014.

CDC enhances analysis program for Cyber 200 supercomputers

MINNEAPOLIS — Control Data Corp. has announced that the UAI/Nastran program, designed for advanced general-purpose finite element structural analysis, has been enhanced to run on the CDC Cyber 200 series supercomputers.

UAI/Nastran was developed by Universal Analytics, Inc. (UAI), which adapted the National Aeronautics and Space Administration's Structural Analysis (Nastran) program to create the product. CDC also announced a companion version that runs on the Cyber 180 series computers.

UAI/Nastran is designed for a variety of engineering applications, including static and dynamic structural analysis, steady state and transient heat transfer analysis, three-dimensional fluid-structure interaction problems and buckling.

The program is used for the analysis of structural designs for aircraft and spacecraft, automobile frames

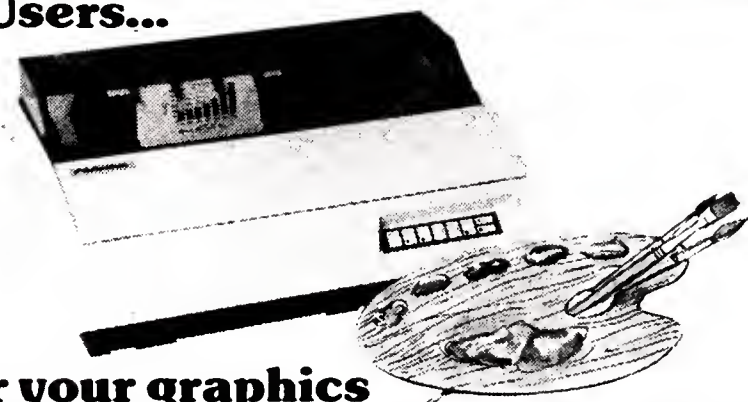
and bodies, turbine and jet engines, bridges, high-rise buildings, nuclear power plants and power transmission towers.

With enhancements in the product for the Cyber 200, structural problems of virtually unlimited size can be analyzed, a spokesman said. An automated multistage substructuring feature reduces the difficulty of setting up large structural models.

UAI/Nastran for the Cyber 180 Model 810 is available for an initial \$2,550 fee and a monthly fee of \$2,100. For the Cyber 180 Model 860, the initial fee is \$2,550, and the monthly fee is \$2.95 per CPU minute, or \$2,100 per month, whichever is greater. For the Cyber 205, the initial fee is \$12,000, and the monthly fee is \$10.25 per CPU minute of \$6,000 per month, whichever is greater, the vendor said.

CDC is located at 8100 34th Ave. S., HQW10H Systems Division, Minneapolis, Minn. 55417.

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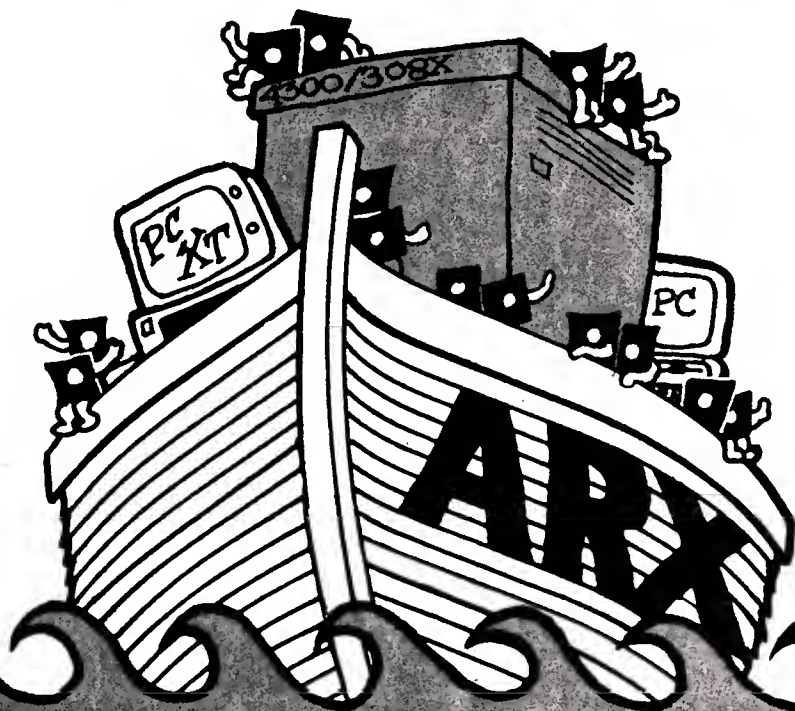
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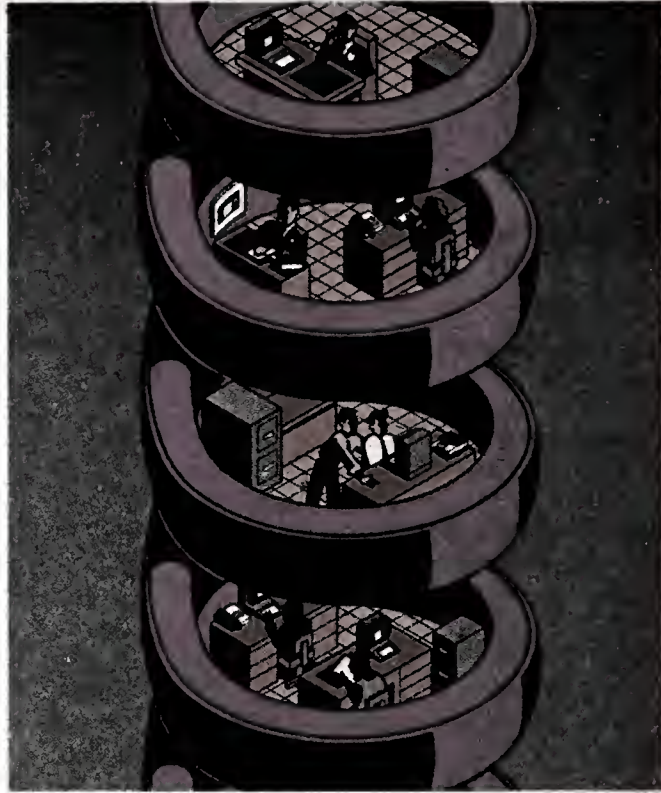
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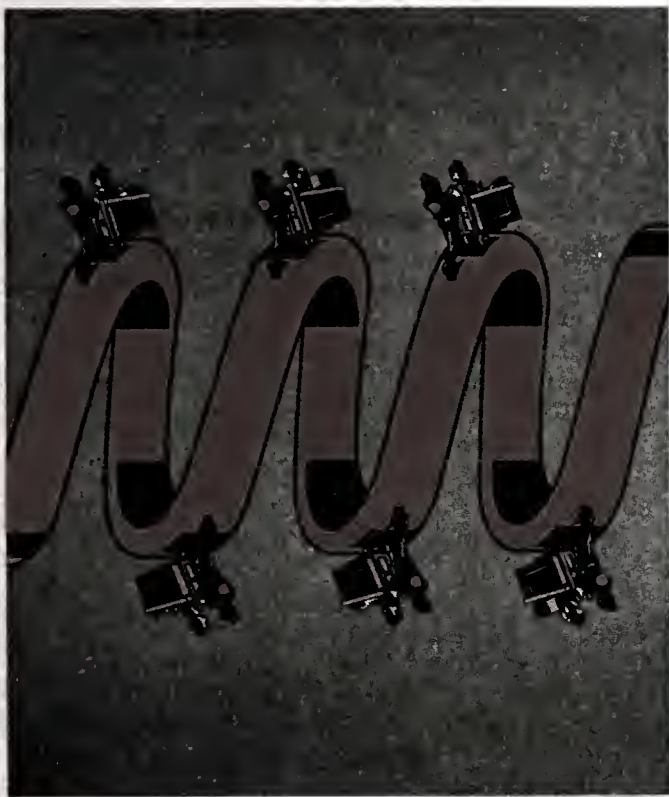


Data Management



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SOFTWARE & SERVICES

Nixdorf announces series of software

WALTHAM, Mass. — Nixdorf Computer Corp. last week announced a series of software products for various systems in its product line.

The following were included in the announcement:

■ Release 2 of Nixdorf's Nidos/VSE operating system for the Nixdorf 8890. Release 2 includes two features that extend the 8890's capabilities in a distributed processing environment: a job transfer program and a file transfer program. Release 2 also supports a multihost facility, said to provide terminal networking capabilities, the company said.

Release 2 also provides enhanced support for IBM-type Fixed Block Architecture storage devices. Release 2

costs \$12,000 for a one-time fee and is available immediately.

■ An enhanced Programmer Workstation Partition Data Set, called PWS II, for Nidos/VSE Release 2. The package provides an on-line interface to the PWS library and features support for accessing system functions like console support, spooling and transaction control programming. The package costs \$3,750 and can be leased for \$125/mo.

■ Market Master, a property appraisal and tax collection package for the 8850. The property appraisal segment of the package costs \$16,000, and the tax collection costs \$7,300, the company said.

■ An applications development

package for the 8890 called Hibol/TCP. The package runs under Nidos/VSE Release 2 and is supported by Nixdorf's Task Control Program. Hibol/TCP is said to generate all of the code required for Cobol/TCP programs by producing Cobol source code. The company claimed use of the package can reduce debugging time by as much as 80%. It costs \$15,000 for a one-time license fee or can be leased for \$500/mo.

■ Comet Calc, a spreadsheet program for the company's 8870 minicomputers. It costs from \$350 to \$750, depending on the 8870 configuration.

Nixdorf is located at 300 Third Ave., Waltham, Mass. 02154.

SYSTEMS SOFTWARE

■ Unipress Software, Inc. has introduced the Amsterdam Compiler Kit for AT&T Unix-based processors.

The Amsterdam Compiler Kit is a package of Basic, C and Pascal native and cross-compilers for a variety of processors, including Zilog, Inc.'s Z8000 and Z80; Intel Corp.'s 8080; and Motorola, Inc.'s 6502. The kit includes complete source code for programs as well as internal documentation for modifications or programming language additions, the vendor said.

The Amsterdam Compiler Kit is priced at \$9,950.

Unipress Software, 2025 Lincoln Highway, Edison, N.J. 08817.

■ BMC Software, Inc. has announced two packages in the Superoptimizer product family, systems software said to reduce the size of messages going to and from an IBM IMS/VS or CICS/VS system and its 3270 family screens and printers.

The Superoptimizers improve end-user response time on remote 3270 terminals by sending smaller messages faster, according to a spokesman. Queuing or other network delays are reduced because smaller messages mean less load on the network.

The products allow older IBM printers, such as the 3268, to begin printing sooner by reducing the time it takes to transmit a page of data. For Systems Network Architecture character set printers like the 3267, which begin printing when they receive data, the Superoptimizers examine the data to be printed and send tabbing orders to boost printing speed.

In other features, Superoptimizer detects outbound or inbound data stream errors; supports 3270 functions like program-defined symbols, extended attributes and windows; and exploits IBM's MVS/XA, the vendor said.

Superoptimizer/CICS, available now, is priced at \$17,250 for the first CPU. Superoptimizer/IMS is scheduled for fourth-quarter availability.

BMC Software, P.O. Box 2002, Sugar Land, Texas 77478.

■ Westinghouse Electric Corp. has announced Multsess software for increasing the productivity of network terminal users.

Executing as an IBM Vtm application program under the MVS operating system, Multsess provides single-key switching between multiple applications without rendering them inactive, the vendor said. With Multsess managing sessions, one terminal can do the work of several and reduce system overhead.

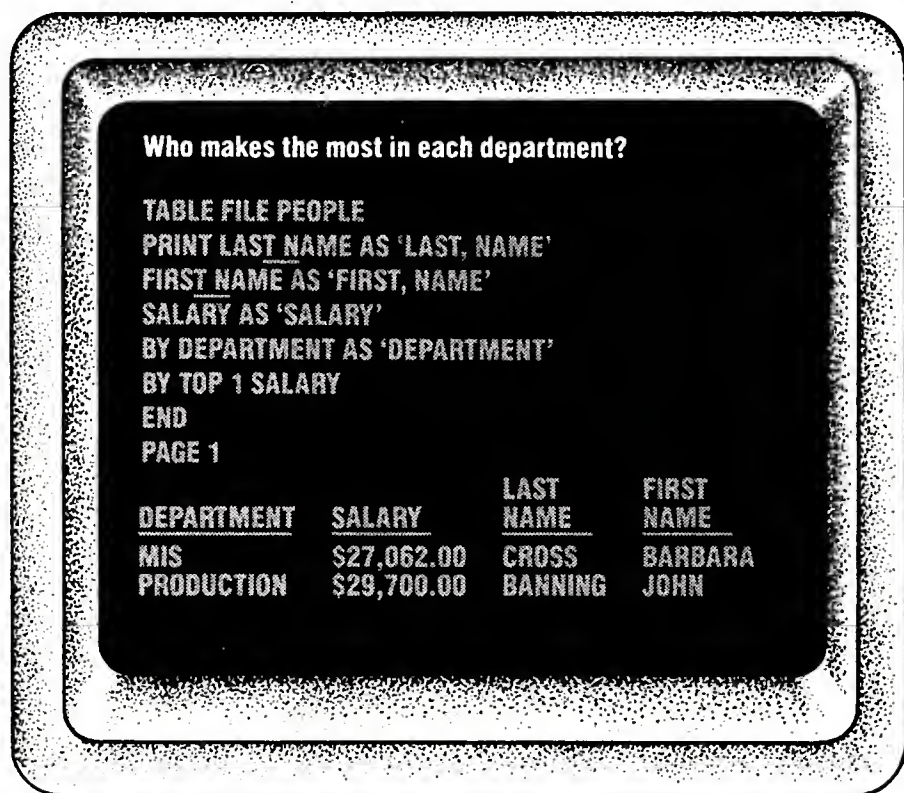
Multsess allows ACF/Vtm users to execute multiple and concurrent applications sessions such as TSO, CICS and IMS without logging off and on. Full security system interfaces, with cross-domain support and automatic profile execution, are included with Multsess. To enhance security, the Multsess directory restricts terminals to predefined applications.

The perpetual license fee for Multsess is \$14,000.

Westinghouse, Management Systems Software, 777 Penn Center Blvd., Pittsburgh, Pa. 15235.

See TOOLS page 43

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*Focus is a product of Information Builders, Inc.
INTELLECT/FOCUS runs on IBM and IBM-compatible mainframes.

SOFTWARE & SERVICES

TOOLS from page 42

■ **Data 21, Inc.** has announced **CICS-Help 4**, an IBM CICS windowing package that provides Help windows for CICS applications and allows multiple applications to run on a single CICS terminal. The package runs in IBM MVS and DOS environments.

Release 4 allows Help screens to be added and updated while the application they document is executing, a spokesman said. Help screens can be added to conversational programs with no program modifications. Multiple CICS applications may be active on a single CICS terminal and toggled using a function key. CICS applications can be initiated with a dedicated key without affecting the transaction currently running on the terminal.

CICS-Help windows can be designed to replace the entire application screen or a portion of the screen, the vendor said.

The perpetual license fee for CICS-Help is \$3,995 for DOS systems and \$7,995 for MVS systems.

Data 21, 3868 Carson St., Suite 300-5, Torrance, Calif. 90503.

■ **University Computing Services Corp.** has announced that its interactive Cobol/Cobol 74 debug facility is available for Burroughs Corp. Burroughs A series, as well as B5000, B6000 and B7000 mainframes.

The product includes the ability to display or change program variables and interrupt program execution at user-selected breakpoints. It also includes on-line Help facilities and the ability to perform line-by-line or multiline program continuation, reference and display of source code.

It is priced at \$7,500.

University Computing Services, 254 E. Main St., Newark, Del. 19711.

■ **A+ Software, Inc.** has announced the **Systems Programmer** series for IBM's MVS. The product provides Dasd analysis and management facilities.

Product features include Dasd configuration flow analysis, tuning aids, component failure impact analysis and a variety of cross-reference reports, a spokesman said. Utilities aid load module analysis, job control language validation and date conversion.

A disaster recovery planning facility supports IBM component failure impact analysis methodology. All resources required to run a job or system, such as tape drives, Dasd and work space, are identified. On-line and batch analysis tools are provided for flowcharting single jobs or an entire system.

The tools run under MVS. Systems Programmer series software is priced at \$7,500.

A+ Software, 16 Academy St., Skaneateles, N.Y. 13152.

■ **Lawson Associates, Inc.** has announced the **Access/38** and **Access/DB** business management software for IBM System/38 users.

The Access/38 package allows users to define and execute their own on-line inquiries and generate reports using standard System/38 data. The software costs \$9,000.

The Access/DB package, geared to

the data processing professional, is said to enable the creation of on-line, interactive IBM RPG-III programs allowing for additions, changes and deletions to the data base. It costs \$4,000.

Lawson Associates, 2021 E. Hennepin Ave., Minneapolis, Minn. 55413.

■ **Adpac Computing Languages Corp.** has introduced **Version D1.09** of its **Diagraphs** for Data Processing (DFDP) for developing system specifications on an IBM 3270 or compatible terminal under IBM's MVS/TSO operating system.

DFDP Version D1.09 includes an extended data definition library that stores information about an analyst's specifications, including record and file layouts and data elements.

Information in the data definition library can be uploaded into any of the major data dictionaries. The system can also download information from the data dictionary and provide the analyst with a list of data elements and their corresponding codes.

DFDP D1.09 is priced from \$9,500 to \$20,000.

Adpac, 340 Brannan St., San Francisco, Calif. 94107.

■ **Advanced Systems Concepts, Inc.** has announced an enhanced version of its **Probe** analysis tool for IBM System/38 applications.

Probe allows users to display all programs referencing physical data elements, regardless of logical view or file redirection. The product also allows users to view programs that access particular data elements or

fields within a file group.

Probe is priced at \$1,000.

Advanced Systems Concepts, Suite S, 1350 Remington Road, Schaumburg, Ill. 60195.

■ **On-Line Software International, Inc.** has introduced **Verify**, a system for regression testing IBM CICS application programs on IBM mainframes under DOS or OS.

Verify is said to eliminate the need for repetitive operator input by providing automatic testing capabilities. Screen I/Os are logged to the disk for examination, either as full screens or field by field with character and hex formatting capabilities. Previously logged data can be used to retest modified applications programs, the vendor said.

Continued on page 44

翻譯機

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SOFTWARE & SERVICES

Continued from page 43

The product can print I/O screen displays in a variety of formats that can be used for generating programmer documentation and user-reference manuals.

Verify is priced at \$25,000 for DOS and at \$35,000 for OS.

On-Line Software International, Fort Lee Executive Park, 2 Executive Drive, Fort Lee, N.J. 07024.

■ **Morino Associates, Inc.** has introduced Release 2 of its MVS Problem Alert System (MVS/PAS) for diagnostic support of IBM's IMS and DB2 data base management systems.

MVS/PAS Release 2 includes a Program Temporary Fix Chain Management Facility that provides a resolution set of fixes required to correct

software problems and can automatically generate System Modification Program control statements for application of the fixes. The product also includes enhanced reporting capabilities for identification, prioritization and solution of systems maintenance problems.

MVS/PAS costs \$12,000.

Morino Associates, 8615 Westwood Center Drive, Vienna, Va. 22180.

PRODUCTIVITY AIDS

■ **Manifold, Inc.** has introduced Version 1.2 of Ada-Quick, an applications development tool for users of Software AG's Adabas data base management system and Natural fourth-generation language.

Version 1.2 of Ada-Quick allows users to access Adabas through a menu-driven environment. User views can be incorporated into other on-line systems, and user-generated profiles can be saved for later use, the vendor said.

Ada-Quick is priced at \$7,500.

Manifold, Suite 7, 1655 Greenfield Ave., Los Angeles, Calif. 90025.

■ **Advanced Systems Concepts, Inc.** has announced that its Productivity Plus package for IBM's System/38 now includes a device configuration flowchart. Productivity Plus offers System/38 programmers additional functions, such as display file recompilers and file re-creation modules.

According to a spokesman, the flowchart produces a diagram of the

relationships between all devices configured on a System/38. Devices listed on the same path are listed in ascending address order. System devices, as well as devices connected to any workstation controller, are detailed.

Each module is priced at \$95, and the entire package costs \$600.

Advanced Systems Concepts, Suite S, 1350 Remington Road, Schaumburg, Ill. 60195.

APPLICATION PACKAGES

■ **Digital Equipment Corp.** has announced Version 2 of its VAX VTX videotex software for its VAX line of computers.

VAX VTX Version 2 allows users to create personal menus to go directly to frequently accessed pages and select more than one choice per menu. It also includes an unlimited keyword search facility to find information residing on a remote system.

The product will be available in September. Prices for VAX VTX range from \$9,000 for the Microvax to \$37,500 for the VAX 8600 systems.

Digital Equipment, 146 Main St., Maynard, Mass. 01754.

■ **Expanded on-line capabilities** have been added to Release 5.5 of Software International Corp.'s Accounts Payable package for Wang Laboratories, Inc. Wang VS minicomputers.

The enhanced Accounts Payable system is said to take advantage of the Wang system's internal capabilities, as well as Wang's native keyed-file access method. Expanded inquiry capabilities give users immediate access to information in the data base.

Accounts Payable provides the ability to perform inquiries by vendor name, invoice or voucher number. Software International's Accounts Payable system is priced from \$12,000 to \$21,000, depending on configuration.

Software International, 1 Tech Drive, Andover, Mass. 01810.

■ **Control Data Corp.'s Business Information Service** has added a market analysis module to its Marksman decision support software for marketing executives.

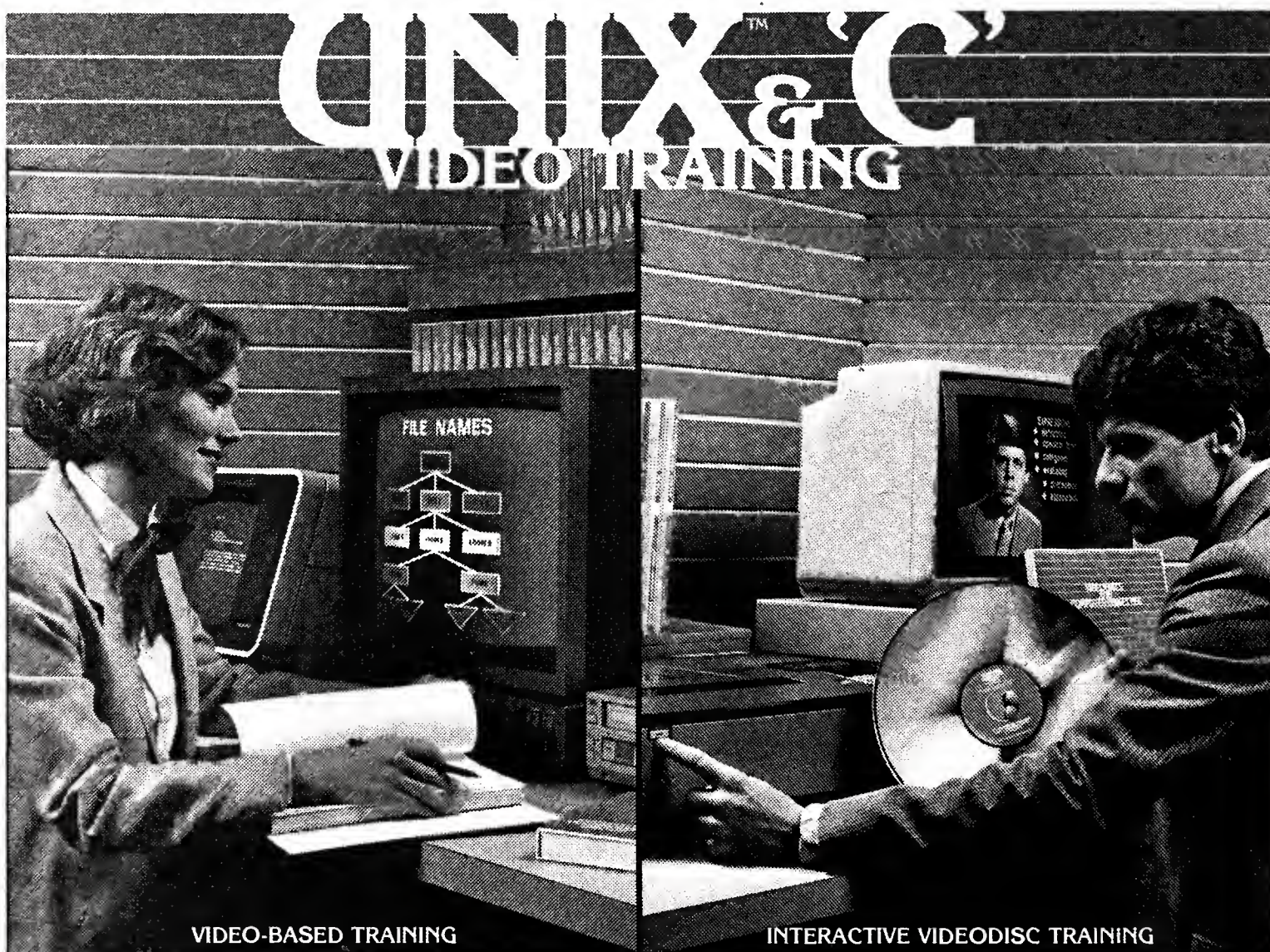
Marksman is available for the IBM 4361 mainframe or Wang Laboratories, Inc. VS minicomputer and includes advertising support and promotion modules.

The market analysis module includes a Nielsen analysis feature that allows users to view various Nielsen measures. The module can perform percentaging, consolidation and indexing operations, exception reporting, market segmentation analysis and can support "what-if" analyses.

The module also provides analysis capabilities using data for warehouse, withdrawals, share and pricing information, data for weight value, number of ads and feature pricing. It also includes a brand development index/category development index facility.

Marksman is priced at \$250,000 and is also available through the Control Data Shared Network.

Control Data, 500 W. Putnam Ave., Greenwich, Conn. 06830.

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SOFTWARE & SERVICES

SLUMP from page 37

ers. Profit and revenue figures attested to the health of the independent large systems software industry and the growing importance of software itself. In-house software development has become, for many organizations, prohibitively expensive, and qualified software professionals are increasingly scarce. Both factors continue to fuel the growth of the packaged soft-

ware industry.

But while the specter of slowdown may only be standing in the doorway for now, its visage is sobering.

Although analysts are still predicting seemingly healthy 25% to 30% growth for the remainder of the year, many software companies based their 1985 spending on earlier, more sanguine revenue forecasts. Expenditures for training, hiring, customer service and research and development were founded on

revenue assumptions that may soon be shaken.

In the short run, those fixed costs will take their toll on profits if revenues sag. In the long run, should the slowdown in users' capital spending worsen, software vendors may look to trim costs through reductions in training programs and hiring. If the slump continues unabated, many vendors will have little choice but to lay off staff or pare R&D programs. Such steps

are taken at both the vendor's and the user's peril.

"The software companies have their training, hiring and development efforts running at pretty aggressive levels right now," said Peter Cunningham, president of Input, Inc., a Mountain View, Calif., market research firm.

"People are the biggest factor," Cunningham continued. "They have to develop, sell, install and support the software and train the users. Software vendors cannot af-

ford to stop development, hiring and training. If they try to turn off their staffing and development projects because of variations in orders, they could be in deep trouble."

So could users. The backlog of tasks awaiting automation and the applications needs uncovered daily demand a constant and increasing flow of new software products. A bottleneck in the development pipeline would ensure plenty of lost opportunities for both vendors and users.

According to Cunningham, the growing maintenance income of the large software companies, which represents a substantial chunk of revenue for a vendor like Computer Associates International, Inc., will act to dampen the oscillations spawned by the slump.

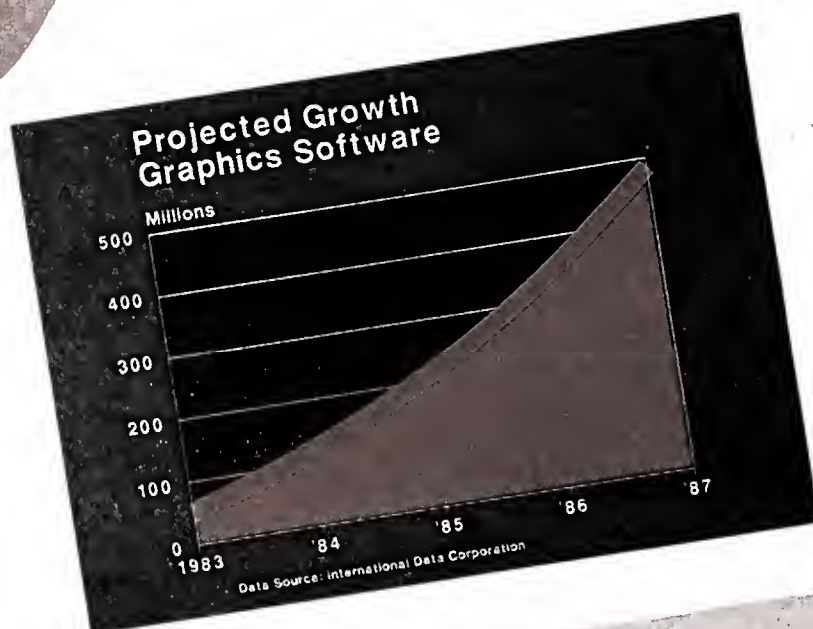
And there is one bright spot for users amid the bad news. Several analysts and company executives cited the possibility of more drastic price cutting due to increased competition among vendors.

Overall, the onus for weathering whatever forces hit the industry rests on the shoulders of the management of software companies. Those executives who can effectively corral costs without overreacting — and slashing staff and development projects — will probably find it quite comfortable living with more moderate, but still enviable, growth.

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HRMS from page 37

will be a beta test site this fall for IBM's forthcoming 3090 mainframe and will migrate from CICS to Cullinet's IDMS-DC teleprocessing monitor.

A big advantage of IDMS is that it is structured for easy expansion, an important consideration for an acquisitive corporation like Allied, Armstrong said. IDMS is a "natural blend" with the Tesseract software, he said.

In the future, Tremlett and Armstrong said they will continue to fine-tune the HRMS and bring hourly and international employee records into the system. Armstrong added that downloading mainframe data to personal computers may be arranged in the future — for statistical modeling and forecasting, for example — but only if a strong need is proved.



"Which would you rather believe, an old computer print-out or me?"

MICROCOMPUTERS

Martin Marietta expands IT micro software line

PRINCETON, N.J. — Martin Marietta Data Systems' ITSoftware division has expanded its line of IBM Personal Computer software with the introduction of Runit, a PC-DOS shell, and Mailit, a document conversion and transfer program.

The \$100 Runit package provides a consistent user interface among various applications and simplifies program selection, use of PC-DOS utilities and mainframe logon, according to ITSoftware President Norm Agin.

With function keys and pop-up menus, the package allows users to design a customized main menu that is displayed when the micro is turned on. Users can select a program with a mouse or cursor command, and they do not have to remember the program's directory or how to start it, Agin said.

Runit pop-up menus also reportedly permit users to execute most PC-DOS operating commands without knowing the command syntax or typing in commands.

Additionally, the package lets users design their own applications directories.

After writing logon scripts with the Runit logon language, the user is presented with the scripts in a pop-up menu when the logon option is selected from the main menu. The only action required to attach to a mainframe operating system or application program is to provide a password, according to the vendor.

The logon feature is currently available for IBM MVS/TSO and VM/CMS operating systems and Digital Communications Associates, Inc. (DCA) and CXI, Inc. 3270 emulation boards. Forte Communications, Inc. boards, Hayes Microcomputer Products, Inc. modems and Renex Corp. protocol converters will be supported in a subsequent release, scheduled for third-quarter delivery. That release also will support virtual disk storage on the mainframe, according to Agin.

Runit requires 64K bytes of internal
See **RUNIT** page 62

MICRO BITS/THOMAS MADRON

PC-DOS 3.1 offers added functionality

IBM's PC-DOS 3.1 operating system for the Personal Computer and Personal Computer XT and AT provides several new features and resources, including two additional commands for end users and six new PC-DOS function calls that directly support networking.

Excluding the utility programs distributed with PC-DOS, the operating system itself consists of four components: the boot record; the read-only memory Basic Input/Output System (ROM Bios) Interface; the PC-DOS program file, IBMDOS.COM; and the command processor, Command.COM.

IBMDOS.COM provides, among other things, a variety of built-in standard functions accessible by user programs. The PC-DOS functions are available through various interrupts, with interrupt 21H being standard across various implementations of MS-DOS, including PC-DOS.

Some PC-DOS networking functions were provided in PC-DOS 3. The additional required functions, 5E00H through 5F04H, are implemented in PC-DOS 3.1. None of these six functions will work without IBM's Netbios, and they are irrelevant in stand-alone personal computer environments. Those functions obtain a machine name on the network, set and get printer setups on a print server and carry out other network housekeeping.

Machine name here means the server name on the PC Network as specified in an Ascii string containing a path

See **PC-DOS** page 62

Madron is manager of computer services at North Texas State University, Denton, Texas.

■ Ricoh announced two microcomputer printers and a digital image scanner/**48**

■ Micro Focus introduced Co-Math, a library of mathematical functions that works with the vendor's microcomputer Cobol products/**48**

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Signs of saturation increase



SMALL TALK
Eric Bender
CW Senior Editor

Everyone seems to have a list of reasons for the current computer industry slump, typically beginning with the nationwide slowdown in capital investment. This long, slow summer will give us all plenty of time to polish those explanations, but "saturation" keeps cropping up in discussions of micro purchasing with MIS personnel.

In this case, saturation obviously doesn't mean that a personal computer now sits proudly on every desktop in corporate America or that the multi-

tudes of machines out there are anywhere near reaching their potential.

It does mean that after several years of struggling to equip a suitable suite of micro equipment for word processing, financial analysis and data base management, many companies have filled the pipeline to their users. And the other emerging stand-alone applications just have not created anything like that level of demand.

"You're not seeing the kind of helter-skelter buying you saw in '83," commented Rich Reed, manager of office systems at Cigna Corp.'s employee benefits and health care division in Bloomfield, Conn. "Everybody was caught up in this buying frenzy. That's changed; purchases now are much

See **SATURATION** page 62

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IBM SQL/DS and DB2 relational DBMS now on PC

ORACLE, the relational DBMS compatible with IBM's SQL/DS and DB2, is now available on the IBM PC/XT and PC/AT. While SQL/DS and DB2 run only on IBM mainframes, ORACLE runs on IBM mainframes as well as on DEC, DG, HP and most other minis and micros. Any application written for SQL/DS or DB2 will run without modification on the complete range of systems supporting ORACLE, including PCs.

SQL/DS and DB2 are relational database management systems; ORACLE is a relational DBMS plus an integrated set of 4th generation software tools for application generation, report writing, color graphics and network communications.

Oracle Corporation introduced the first relational DBMS in 1979. Now, ORACLE provides the only complete implementation of the IBM-standard SQL language available for the PC.

Oracle Corporation cites three principal application areas for its product's capabilities:

■ The ORACLE Application Development Center provides a PC-based development center for the crea-

tion of DB2 and SQL/DS applications. The flexibility of the personal computing environment is made available to programmers creating applications for use with IBM's relational database products.

■ The ORACLE Personal Information Center extends the Information Center concept to the Personal Computer. ORACLE's application generator, graphics, spreadsheet and other end-user tools provide a SQL/DS and DB2 compatible Information Center on the desktop.

Users can become acquainted with the facilities and power of the Information Center in the personal computing environment, and transfer their knowledge and skills as the MIS Information Center facility evolves. The ORACLE Personal Information Center provides the facilities for MIS to develop the cooperative relationship with end users so vital to the success of the Information Center.

In addition, with ORACLE on departmental superminis, users can create identical Information Centers at the department level.

■ The ORACLE Distributed Information Center provides an intelligent set of communication links among multiple systems, with ORACLE running on IBM mainframes and various minis and PCs.

Using ORACLE's SQL*LINK networking facility, ORACLE on such diverse systems as MVS, VM/CMS, VAX/VMS, UNIX and PC/DOS can selectively exchange database information using the full capabilities of the SQL language. Applications, portable across all environments, can be run identically on any system, and data can be intelligently extracted for use at any site.

ORACLE is currently installed on over 1000 supermini and mainframe systems around the world, as well as on thousands of PCs and compatibles. Oracle's customers include 8 out of the 10 largest U.S. corporations, as well as major foreign companies and many government agencies.

For further information, contact Oracle Corp., Dept. C, 2710 Sand Hill Rd., Menlo Park, CA 94025, or call 415/854-7350.

MICROCOMPUTERS

Ricoh unveils printers, scanner for micros

WEST CALDWELL, N.J. — Ricoh Corp. has unwrapped a laser printer, a thermal transfer printer that can be changed to a color printer with optional software and a digital image scanner for microcomputers.

The Ricoh LP4080 tabletop laser printer costs \$3,000 and has both RS-232 serial and parallel ports for use with microcomputers. The 8 page/min printer is said to produce either portrait or landscape output at a resolution of 300 by 300 dot/in. from either four on-board fonts, host-data downloads or cartridge-loaded fonts.

The printer emulates the Diablo Systems, Inc. Diablo 630 impact printer and has a bit-mapped memory that is said to permit printing

forms, logos and other forms of graphics data in areas of up to 35 sq in. Downloaded graphics can be printed with up to four times the magnification, the vendor said.

Ricoh's TP2051C, which costs approximately \$400, is a thermal transfer color printer that is said to print text and graphics in seven colors on either plain paper or transparencies.

At a print resolution of 180 dot/in. using a 24-dot print head, the TP2051C prints bit-by-bit CRT-displayed graphics and character-by-character IBM CS1 and CS2 plus nine international character sets.

A parallel Centronics Data Computer Corp. interface is standard.

The company's flatbed digital im-

age scanner, the IS30, is said to provide a basic reading density of 300 by 300 dot/in. It also can produce 180, 200 and 240 dot/in. for compatibility with a variety of output printers, including ink-jet, laser, thermal transfer and dot matrix printers.

The IS30 is said to be able to read books, sides of boxes and thick documents that can be placed on the 8½-by 11½-in. flatbed. Maximum reading speed is approximately 14 sec. for an 8½-by 11-in. document at 300 dot/in. The unit, which will cost approximately \$2,000, comes with a parallel interface and will be available in fourth-quarter 1985.

Ricoh is located at 5 Dedrick Place, West Caldwell, N. J. 07006.

CXI beefs up Pcox tool

PALO ALTO, Calif. — CXI, Inc. has announced an upgrade to its Pcox 3270 PC software which gives users of Digital Communications Associates, Inc.'s Irma 3278 emulation board the functionality of an IBM 3270 Personal Computer terminal.

The Pcox software upgrade, for IBM Personal Computers, Personal Computer XT's, AT's and compatibles, permits simultaneous viewing of up to five interactive host applications, two notepads and a Personal Computer session on a microcomputer screen.

With the Pcox 3270 PC upgrade, information can be transferred from one window to another or at variable spots within the same window. Users can combine information from one or more host sessions, as well as a Personal Computer spreadsheet in the form of a customized report in a notepad session.

Attached parallel or serial printers can also be transformed into host-addressable IBM 3287 printers, CXI said.

The product reportedly gives Irma users an interface to the IBM 3270 Personal Computer Application Program Interface (API), permitting them to run software developed for the API.

Available in August, the software also is compatible with CXI's Pcox 3278 and Pcox 3279 Standard and Plus coaxial connections, the vendor said.

Typical usage of the Pcox 3270 PC requires about 264K bytes of memory. Maximum usage requires 327K bytes of memory.

Pcox 3270 PC software costs \$395.

For more information, CXI is located at 3606 W. Bayshore Road, Palo Alto, Calif. 94303.

Micro Focus' math aid out

CHICAGO — Micro Focus, Inc. last week introduced Co-Math, a library of mathematical functions that works with the company's microcomputer Cobol offerings.

The new software will permit programmers who design and maintain financial and mathematical programs to stay within the standard Cobol environment and create programs utilizing extended mathematical functions, according to the vendor. Priced at \$200 and available immediately, Co-Math works with Micro Focus' Professional Cobol, VS Cobol Workbench or VS Cobol.

Co-Math's mathematical functions reportedly include exponentiation, power, square root, natural log, log 10, sine, cosine, tangent and arctangent XY. The product can be used in conjunction with Micro Focus' Co-Graphics software, the company said. Co-Graphics is said to provide access to Virtual Device Interface standard graphics routines supplied by Graphics Software Systems, Inc.

More information is available from Micro Focus at 2465 E. Bayshore Road, Palo Alto, Calif. 94303.

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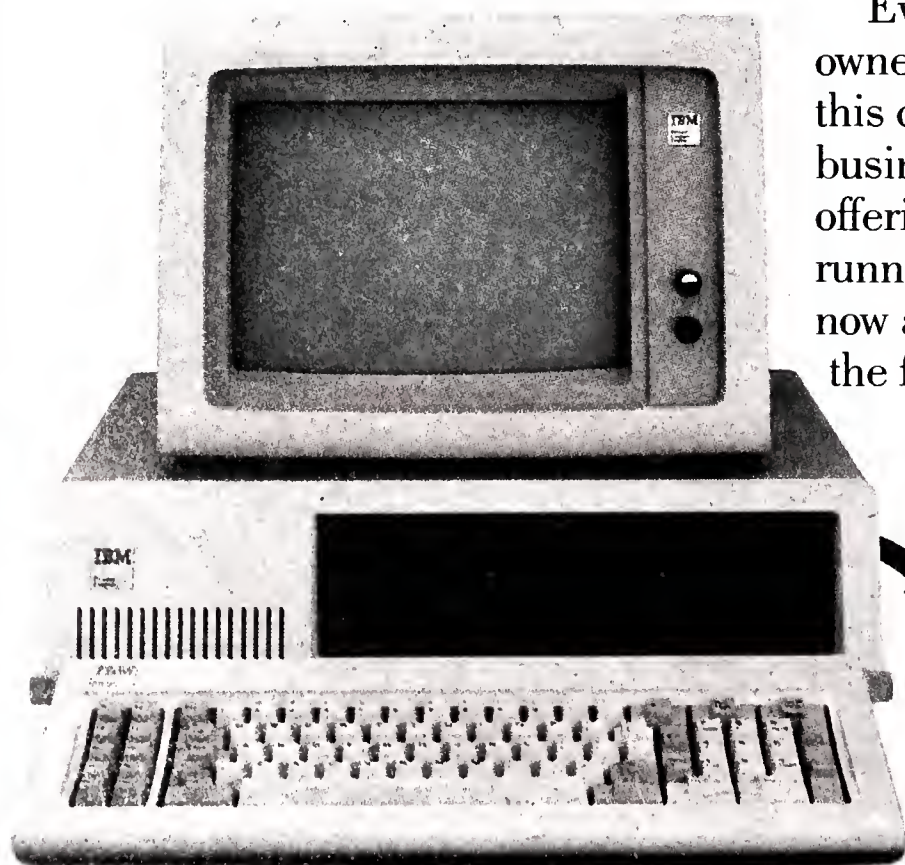
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System/36 PC can be a standalone computer for small companies or a departmental system or even part of a distributed network for larger companies, providing multiuser access to data.

The System/36 PC is made up of a 5364 Processor attached to an IBM PC, PC XT or PC AT. And you can connect up to three more of these personal computers. Or you can connect terminals such as System/36 printers or displays.

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Whether your business has two employees or more than 2,000, the System/36 PC can combine the personal productivity of your PC with the business applications of the System/36 Family.

The System/36 can handle all facets of your business—distribution, sales analysis and general ledger functions. Accounts payable, inventory control and payroll.

IBM System/36 PC.

And you can get traditional PC functions such as spreadsheets and word processing.

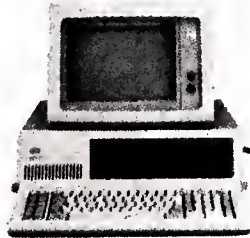
Software for the System/36 has been developed over the years and has proven invaluable in all kinds of businesses of all sizes. And with the thousands of programs written for both IBM PC and System/36, the sky's the limit for business and planning applications.

The System/36 PC even provides you with data security features so that the right data gets into the right hands.

Small yet powerful.

All of this processing power can sit right on a desk or under it—either horizontally or vertically. It measures a mere 21¼" x 16¾" x 6½"—about the size of a small suitcase.

Yet as small as it is, this little box has multiple processors, with main memory that can be dedicated to running your business functions. In plain English, this means you can get better response time. The System/36 PC comes with a 1.2 MB diskette drive and either 40 or 80 MB disk storage, depending on your information storage needs.



Easy to use.

The System/36 PC is easy to learn and to use. If you need assistance, it has over 2,800 "help" screens that take you step-by-step through any rough spots. You can merge data you've generated on your PC with information that's on your System/36 PC. And you can share information that is stored in the System/36 PC with other attached IBM Personal Computers or System/36 terminals.

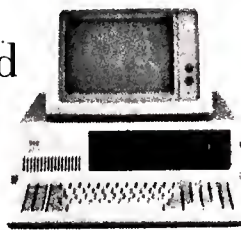
Compatibility is high so that you can keep on using many of the PC peripherals and programs you may already own.

Easy growth.

What happens when your small office becomes bigger?

That's what the System/36 Family is all about. No matter what size your business, there's a member of the System/36 Family that can help you do whatever you do, better.

As your needs become greater, there's the mid-sized 5362 processor that offers greater performance and can handle up to 22 personal computers or System/36 terminals.



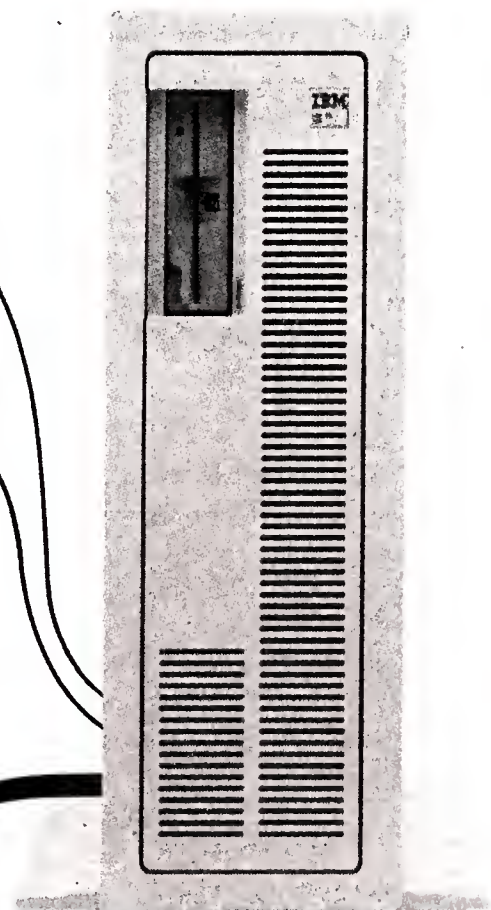
Then there's the original System/36—the 5360 processor—the largest member of the System/36 Family, which can handle up to 36 personal

computers or System/36 terminals.

Any one of these processors can function as the central processor in your office. Each can communicate with PCs or larger systems, giving communication and connectivity new meaning by allowing departments to share data.

So if your dreams are big but your office is small, the new System/36 PC is the perfect step for you to take. You not only get the best of both worlds, you also get IBM product reliability. And authorized IBM on-site service is available anywhere in the U.S.A.

For a free brochure on the IBM System/36 PC or for information on product availability from participating IBM Product Centers, Authorized PC Dealers or Value Added Dealers, call 1 800 IBM-2468, ext. 90, LL. Or call your IBM marketing representative.



MICROCOMPUTERS

Firms join in funding human resources tool

By Edward Foster
Special to CW+

PRINCETON, N.J. — Corporate managers concerned with white-collar productivity have joined a consortium to fund the development of Productivity Map, a program for the IBM Personal Computer that will help track the performance of managers in the way other programs track inventory or sales.

The program is in the early stages of development at Pacesetter Software Co. here. Participants in the consortium include 3M Corp., Westinghouse Electric Corp., GTE Corp., Northern Telecom Inc., Nabisco Brands, Inc. and the U.S. General Accounting Office.

Productivity Map is being designed for "somebody who has to track managers or functions in areas of a company that are difficult to measure," according to Michael Hierl, president of Pacesetter. "What we're hearing from our beta test group is that the big need is not for tracking productivity in manufacturing but in systems, research and development, human resources and other knowledge- and worker-intensive areas."

Consortium members are paying Pacesetter a one-time \$12,500 fee for an organizationwide license to use the software and qualify as a beta test site. The members are also providing Pacesetter with feedback and technical assistance on the various approaches to productivity management that they want to see in the package.

Hierl said he has not decided about pricing or distribution policies for the final product, which is expected by the end of the year, but his inclination is to continue the one-time corporate license fee, probably for a higher price than the beta testers are paying.

Productivity Map will not concentrate on one approach to tracking performance but will instead integrate many different methods now employed by consortium members, using up to 20 different kinds of graphics representations built into the system. A large part of the program will be tutorial in nature.

Pacesetter originally formed its consortium based on experience with Organization Map, a program it sells for producing organizational charts and analyses. Organization Map customers, Hierl said, suggested the outlines of the new program and formed the original consortium membership.

Amy Archambeau, manager of organization and manpower planning for GTE's human resources staff, said that she expects the consortium itself to have a great deal of value, whatever the final result of the software development. "The consortium aspect is a hidden benefit just in terms of the affiliation with other people in the group," she commented.

Foster is a senior writer with Computerworld's sister publication Infoworld, where this story first appeared.

Micro modeling program bows

BREA, Calif. — P-Cube Corp. has announced ISP Methodology, an information systems planning method supported by microcomputer software running on IBM Personal Computers and compatibles.

The ISP Methodology uses a model that shows the relationships between different systems and organizational processes. The model highlights opportunities for improving an organization's information infrastructure and for using computer technology to improve the organization's competitive position, according to the vendor.

The model also is said to simulate the impact of new systems, changes in existing systems and changes in organization processes

and functions.

ISP modules allow users to set priorities on systems projects, to develop corporate data bases and to define the specific set of systems an organization should be developing to meet near-term and long-range information needs. The modules also help users evaluate alternative funding strategies for information systems development.

The package operates under IBM's PC-DOS 2.1 and requires 256K bytes of random-access memory.

The basic price for ISP Methodology is \$12,000.

P-Cube is located at 915 Kings Canyon Road, Brea, Calif. 92621.

SOFTWARE

■ Micro Focus has announced enhancements to its Sourcewriter, a Cobol applications generator for use on the IBM Personal Computer line.

Enhancements to Sourcewriter reportedly include the ability to produce programs that permit multiple users to access the same file simulta-

neously. Also added were systems security features, including password protection, logging and recovery, the latter of which permits files to be restored.

Sourcewriter reportedly generates U.S. General Services Administration (GSA)-certified standard Ansi 74 Cobol source code. It is completely compatible with Micro Focus' GSA-certified Cobol compilers.

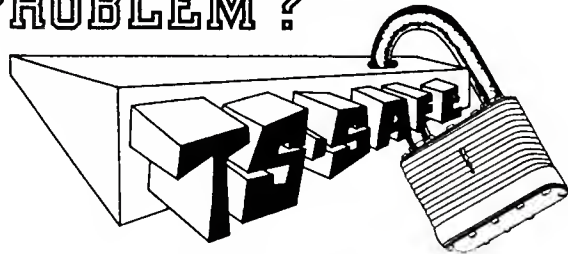
A data dictionary-based tool, Sourcewriter is said to allow applications prototyping.

Sourcewriter costs \$1,395 until July 31 when the price increases to \$2,000. It is also offered in a package with Professional Cobol for \$3,000 until July 31.

Micro Focus, 2465 E. Bayshore Road, Palo Alto, Calif. 94303.

See TOOLS page 53

CICS SECURITY A PROBLEM?



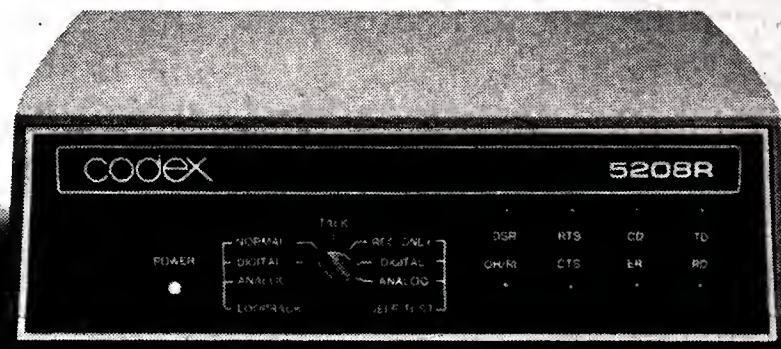
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MICROCOMPUTERS

TOOLS from page 52

■ **Ashton-Tate** has introduced Courseware training materials for use with its Framework and Dbase II and III business software products.

Courseware reportedly can be used for self-paced study or classroom instruction. It provides an introduction to Ashton-Tate applications and instruction in Dbase II and III programming.

Courseware is offered in three packages of increasing complexity, each consisting of a student workbook and an associated instructional diskette. Administrative teaching kits for instructors include overhead materials and course notes.

Courseware costs \$39.95 for an introductory-level package, \$48.95 for the intermediate Framework package, \$49.95 for the intermediate Dbase II and III packages and \$59.95 for the advanced-level package. The teaching kit is \$185.

Ashton-Tate, 10150 W. Jefferson Blvd., Culver City, Calif. 90230.

■ **Marc Software International, Inc.** has introduced two word processing programs for the IBM Personal Computer and personal computers running under Microsoft Corp.'s MS-DOS operating system.

Wordmarc Composer, a word processor for use with complex documents, reportedly supports multiple-font printing devices for laser and dot matrix printers and the use of mathematical and scientific symbols.

Wordmarc Author is said to be a simple word processor designed specifically for use by managers. All of the formatting functions of Wordmarc Composer are said to be included.

Both programs reportedly were designed in accordance with the University of Chicago Dissertation Office's Manual of Style.

Wordmarc Composer costs \$495. Wordmarc Author costs \$295.

Marc Software International, No. 200, 260 Sheridan Ave., Palo Alto, Calif. 94306.

■ **Structured Software Solutions, Inc.** has introduced Facet, a software package for the creation of windows on the IBM Personal Computer XT or AT that link into an AT&T Unix application running on a host.

The package, which consists of a module for the host and for the Personal Computer under IBM's PC-DOS, reportedly permits users to create up to 10 individual session windows, even while running a PC-DOS application.

The package resides in memory and allows users to configure windows of any size, color or screen placement they wish, according to a spokesman.

The software relies on the X-PC protocol for communication between the Personal Computer and the host, reportedly permitting concurrent file transfer while interactive work continues in other sessions.

The software costs \$195 for the Personal Computer module. Host modules are currently available only for the Personal Computer XT or AT under Unix; they cost \$249.

Structured Software Solutions, Suite 205, 4031 W. Plano Pkwy., Plano, Texas 75075.

■ **Gimpel Software** has announced a diagnostic program for C-language applications running under the Microsoft Corp. MS-DOS operating system.

PC-Lint is said to analyze C programs and to report on bugs, glitches and inconsistencies. The product reports on errors such as type inconsistencies across modules, parameter-argument mismatches, library usage irregularities, uninitialized variables, value-return inconsistencies and variables declared but not used.

PC-Lint is delivered with user-modifiable standard library descriptions for most major compilers, according to Gimpel.

The product requires a minimum of 128K bytes of memory.

The cost of PC-Lint is \$139.

Gimpel Software, 3207 Hogarth Lane, Collegeville, Pa. 19426.

■ **Keyword Office Technologies, Inc.** has announced an IBM Personal Computer software program that reportedly allows users of the Keyword 7000 disk-to-disk conversion system to translate documents for transmission to remote, incompatible word processing systems.

Com-File is said to operate on users' existing telecommunications facilities or networks to allow transmission of documents in revisable form.

Using a diskette from the source machine with the Keyword 7000, users may create Com-File documents on an IBM micro's PC-DOS format floppy or hard disk drive. The Com-File version of the document is transmitted by standard telecommunications services to a remote micro with Keyword 7000, which converts the text from Com-File form to the target

word processor format.

At each end of the transmission, Com-File requires the Keyword 7000 disk drive unit and controller board, an IBM micro with minimum internal memory of 256K bytes and communications hardware and software that support 8-bit transparent transmission.

The cost of Com-File is \$495. Bundled with Keyword 7000 hardware, Com-File costs \$9,995.

Keyword Office Technologies, 2047 Hamilton Ave., San Jose, Calif. 95125.

■ **Viewlogic Systems, Inc.** has announced that its Workview series computer-aided engineering (CAE) software is now compatible with Data General Corp.'s DG/One port-

Continued on page 54

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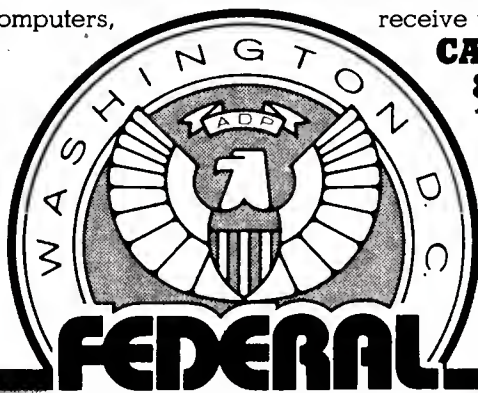
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MICROCOMPUTERS

Continued from page 53
table computers.

The Workview series, which includes an entry-level system, a digital design system and an analog design system, allows electronic design engineers to generate documentation and to communicate to other CAE and computer-aided design workstations, the vendor said.

Engineering functions include schematic entry, interactive logic simulation and wave form processing. Workview can also run on the IBM Personal Computer XT and AT and compatibles.

Viewlogic's Workview series costs from \$3,500 to \$8,500, depending on the module.

Viewlogic Systems, 33 Boston Post Road W., Marlboro, Mass. 01752.

■ **The Key Board** has announced a version of its data base management system for the IBM Personal Computer, Personal Computer XT, AT and PCjr.

The Data Base package is said to feature full disk-file capacity, relative files, 32,000 records per file, 4K-byte record size and 100 fields per record. Functions include sort, append, reformat, field calculations, count and totaling, sequential file interface capability and multiple logical field queries. The software reportedly includes report and mailing label printing capabilities.

The Data Base resides in 128K bytes of memory and runs on most IBM-compatible systems.

Cost of the software is \$49.95.

The Key Board, P.O. Box 753, Cedar Crest, N.M. 87008.

■ **Burt Woolf Management, Inc.** has introduced its Team System, data base management software for the IBM Personal Computer.

Designed for small to medium-size nonprofit organizations, Team System reportedly stores business and home addresses and phone numbers, birth dates and the prefixes and salutations used in correspondence. The ability to print continuous labels or business envelopes is included for use in bulk mail projects.

Users are reportedly able to store up to 10,000 records using Team System in an IBM Personal Computer with a hard disk. On a Personal Computer without hard disk, 250 records can be stored per diskette.

Team System is priced at \$495.

Burt Woolf Management, Suite 214, 167 Corey Road, Brookline, Mass. 02146.

■ **First Byte, Inc.** has announced enhancement and a price cut for its Smoothtalker speech synthesis software for the Apple Computer, Inc. Macintosh.

Smoothtalker Version 2 reportedly now offers a female voice, along with the male voice previously featured.

Smoothtalker reportedly converts English language text, input via the keyboard or an Ascii file, into speech that is output by the Macintosh's built-in speaker. It reportedly works on either the 128K-byte or 512K-byte Macintosh models.

Smoothtalker's price is \$99, down from \$149.95, the vendor said.

First Byte, 2845 Temple Ave., Long Beach, Calif. 90806.

■ **Vertisoft Co.** has introduced a version of its LLB Legal Billing/Office Accounting software for IBM Personal Computers equipped with a hard-disk storage unit.

The software is said to be an integrated time and client billing and general ledger program. The entry of a transaction into the software at one location can automatically cause the entry to be entered at other locations in the package.

The hard-disk version of the package reportedly retains all itemized transactions of each month.

The software in its hard-disk version is priced at \$1,395. The dual-diskette drive version is \$995.

Vertisoft, 447 Willis Road, Saline, Mich. 48176.

■ **Wyman Associates, Inc.** has introduced Ontime scheduling software for the IBM Personal Computer.

Ontime reportedly schedules jobs using any of six methods including FIFO, minimize average completion time, weighted completion time, average job lateness, range of job lateness and number of late jobs.

Actual times can be accumulated and reported along with budgets, profits, time remaining, work loads and capacity forecasts.

Ontime is priced at \$495 and requires 128K bytes of memory and two double-sided, double-density diskette drives.

Wyman Associates, Suite 321, 181 Second Ave., San Mateo, Calif. 94401.

■ **SBT Corp.** has announced professional time and bill-

ing accounting software designed for use with the Ashton-Tate Dbase III or Dbase II data base management systems on the IBM Personal Computer and other microcomputers that run Dbase software.

Dprofessional can also be run independently or with other SBT accounting software programs such as Dpurchase, Dpayable and Dledger. SBT provides source code for user modification and customizing.

Dprofessional is a menu-driven program that allows users to enter and analyze data and generate reports. Other reports include client ledger listing, transaction analysis, billing analysis, cash receipts register, accounts receivable aging and work in progress.

The software requires either the Microsoft Corp. MS-DOS or Digital Research, Inc. CP/M operating system, two floppy drives or one hard disk drive and a minimum total disk capacity of 720K bytes of memory.

The software costs \$395. SBT, 3 Harbor Drive, San Salito, Calif. 94965.

■ **STSC, Inc.** has introduced a version of its APL-Plus UNIX system for the AT&T Unix PC.

An enhanced APL interpreter and applications development system for Unix, the program is said to offer partial compilation of APL code.

Also reportedly offered are true concurrent file sharing, nested arrays compatible with IBM's APL2 and a communications facility that lets users log on to a remote host and transfer data.

The software costs \$995.

STSC, 2115 E. Jefferson St., Rockville, Md. 20852.

■ **Vertical Solutions, Inc.** has introduced several software products for use with Software Publishing Corp.'s PFS:File data base and IBM's Filing Assistant software.

The packages announced included Importer, which reportedly permits PFS:File users to import data from column-oriented Ascii files, and Forms, which reportedly prints invoices, checks, purchase orders and other forms from a PFS:File or Filing Assistant data base.

Also announced were Market Prospector, which reportedly permits a predefined PFS:File or Filing Assistant data base to support the needs of sales workers, and the Market Prospector Plus service, a Vertical Solutions list of potential sales contacts. That list, provided on diskettes, is priced from \$200 to \$2,000.

Also introduced was Startup, which reportedly lets the user develop customized software menus.

Importer and Forms each cost \$140. Market Prospector and Startup each cost \$50.

Vertical Solutions, P.O. Box 5051, Evanston, Ill. 60204.

■ **Sophco, Inc.** has introduced its Protec 3 system security software for the IBM Personal Computer XT and AT.

Protec 3 reportedly offers audit trails that track user names, program used, date used and other criteria. Also included are features to block users from copying software from a shared hard disk and to provide access control via passwords and logon identification codes.

Protec 3 is priced at \$350 and requires Microsoft Corp.'s MS-DOS 2 or higher and 128K bytes of memory.

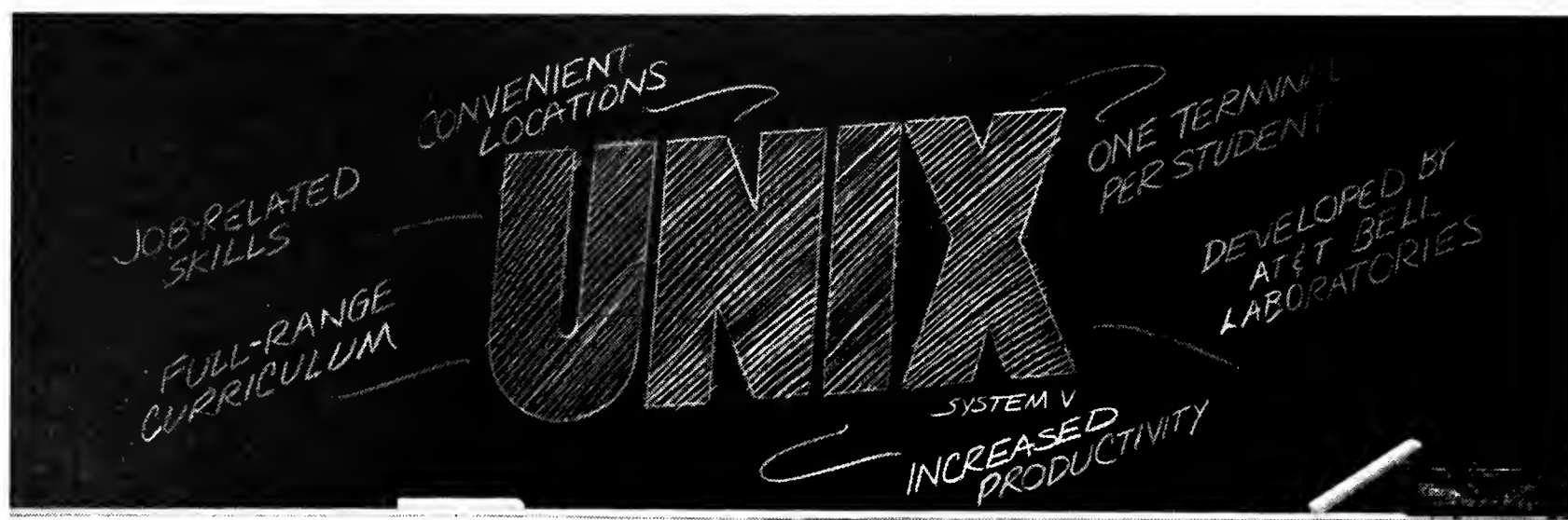
Sophco, P.O. Box 7430, Boulder, Colo., 80306.

■ **Systems Compatibility Corp.** has unwrapped two software products that allow documents to be shared by several microcomputer word processors.

Software Bridge lets users convert among Multimate International Corp.'s Multimate, Micropro International Corp.'s Wordstar, Samna Corp.'s Samna Word and IBM's Displaywrite III on IBM Personal Computers and compatible computers without a protocol translator.

W-Link reportedly provides compatibility between Multimate and Wang Laboratories, Inc.'s Professional Computer Advanced Word Processing. The software converts documents created on either system to a format

Continued on page 55



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MICROCOMPUTERS

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recognized by the other.

Software Bridge and W-Link each cost \$495.

Software Compatibility, 410 N. Michigan Ave., Chicago, Ill. 60611.

■ **Burroughs Corp.** has unveiled three software packages for its B25 micro — Enhanced Multiplan, B20 Draw and Context Manager.

An upgrade to Multiplan, Enhanced Multiplan reportedly adds the ability to solve formulas containing circular references and to retain spreadsheets. In addition, the package increased Multiplan's memory capacity from 32K bytes to 1M byte.

B20 Draw is said to allow users to create pictures and templates from a selection of lines, squares, points, triangles and sine curves.

Context Manager lets up to 10 application programs run concurrently on a workstation under multiple operating systems, including Burroughs' Btos, Microsoft Corp.'s MS-DOS and Digital Research, Inc.'s CP/M 86, according to the spokesman.

Enhanced Multiplan, B20 Draw and Context Manager each cost \$250.

Burroughs, One Burroughs Place, Detroit, Mich. 48232.

■ **Systemware, Inc. and Forecasting Planning Associates** have announced an inventory data base system for data centers that is said to support disaster recovery planning, budget forecasting and analysis, configuration management and component failure impact analysis.

Called Data Center Manager/I (DCM/I), the software consists of four separately priced components: Basic Inventory Module, Budgeting Module, Configuration Module and Maintenance Module.

The Basic Inventory Module is the first available and prerequisite to the others. Its functions include the ability to track equipment and software in-house and on order, purchase and lease costs and financial commitments.

DCM/I runs on IBM Personal Computer XT and compatible computers. The Basic Inventory Module licenses for \$4,995.

Systemware, Suite 1008, N. Central Plaza II, 12770 Coit Road, Dallas, Texas 75251.

SYSTEMS

■ **PC Technologies, Inc.** has announced an enhanced version of its multiuser expansion system for the IBM Personal Computer XT and AT.

The Xtender II expansion board and software reportedly allow the XT or AT to serve as the CPU for up to nine terminals, compared with the five users supported by Xtender I on the XT. Other enhancements include compatibility with, rather than emulation of, IBM's PC-DOS 2.1, and support of asynchronous communications software.

The standard system consists of Intel Corp. 80286 and 80186 microprocessors with an optional 80287 math coprocessor; 1M byte of system random-access memory, expandable to 4M bytes; an I/O interface unit with eight RS-232 ports; and system and utilities software.

The system is said to support most standard Ascii terminals, allowing

them to run micro application programs under PC-DOS 1.1, 2, 2.1 and 3 and Digital Research, Inc. CP/M, MP/M and Concurrent DOS.

The cost of Xtender II is \$4,995.

PC Technologies, Box 2090, 704 Airport Blvd., Ann Arbor, Mich. 48106.

COMMUNICATIONS

■ **Decatek, Inc.** has announced a half-duplex, two-wire, 9.6K bit/sec. modem that fits into an expansion slot of an IBM Personal Computer.

Zipmodem is equipped with protocol conversion software that translates Ascii data into Ebcidic data that conforms to System Network Architecture/Synchronous Data Link Control protocol. The menu-driven pack-

age provides IBM Logical Unit 1, 2 or 3 emulation.

Used with a mainframe Zipmodem, a user is able to monitor transmission errors.

An IBM Personal Computer Zipmodem costs \$2,995 and a mainframe Zipmodem sells for \$1,995.

Decatek, P.O. Box 569, Mountain, Ga. 30086

■ **Racore Corp.** has introduced its Racore-Net baseband local-area network for use with IBM Personal Computer Network software and IBM's PC-DOS 3.1.

Racore-Net reportedly consists of plug-in network interface cards and can link up to 16 machines in the Personal Computer line, with up to 1,000 feet between each machine.

The net is said to be based on a to-

ken-passing ring architecture and to offer 2M bit/sec. data transfer rates.

Each interface card to the network is priced at \$249.95.

Racore, 10 Victor Sq., Scotts Valley, Calif. 95066.

■ **Data General Corp.** has announced an internal 1,200 bit/sec., 300 bit/sec. modem for the Data General/One portable micro.

The modem is said to include an autodial/autoanswer feature. The product allows direct connection with telephone lines through a standard modular jack or can be used with a DG acoustic coupler at 300 bit/sec.

The modem allows users to access DG's Comprehensive Electronic Office (CEO) automation system

Continued on page 56

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through the DG CEO Connection.

The 1,200 bit/sec., 300 bit/sec. modem is priced at \$525.

DG, 4400 Computer Drive, Westboro, Mass. 01580.

■ **Network Software Associates, Inc.** has introduced **AdaptSNA PCcom II communications software** for the **IBM Personal Computer**.

AdaptSNA PCcom II reportedly uses IBM's Synchronous Data Link Control protocol and offers transmission speeds up to 19.2K bit/sec. Also offered are multidrop capabilities, password protection and the use of Help screens.

Other features of the software are said to include autodial capabilities on some modems and a timer/alarm clock. The software can execute IBM PC-DOS commands on a remote Personal Computer from a local Personal Computer.

The package costs \$475.

Network Software Associates, 19491 Sierra Soto, Irvine, Calif. 92715.

■ **Honeywell, Inc.** has announced a version of its **PC 7800 software** that reportedly allows **Apple Computer, Inc. Macintosh micros** to serve as workstations for **Honeywell mainframes** using the **Honeywell GCOS 8 operating system**.

The software enables a Macintosh to emulate a Honeywell VIP 7800 terminal by emulating function keys, attributes and special-purpose switches on the terminal, allowing the micro to access a Honeywell DPS 8, DPS 88 or DPS 90 mainframe. The software accepts character input either from the Macintosh keyboard or from a remote information processor through a communications network.

PC 7800 transfers time-sharing files for interaction with the micro, with protocols for error detection and recovery. Attached printer support allows the transfer of Macintosh screen images directly to a printer.

The cost of the PC 7800 software for the Macintosh is \$295.

Honeywell, P.O. Box 8000/A-79, Phoenix, Ariz. 85066.

■ **US Robotics, Inc.** has announced enhancement of its **Telpac communications software** for the **IBM Personal Computer line**.

Telpac reportedly now gives users five subject headings: file, telephone, utility, settings and a Help mode. Also new are windows that can be displayed for each subject heading to guide the user through the heading's functions.

Telpac reportedly gives users access to files on remote computers and permits them to transfer files to a remote system or move files within their Personal Computers. It was designed to work with US Robotics modems and compatibles and stores an unlimited number of telephone numbers for autodialing.

Telpac costs \$149.

US Robotics, 8100 McCormick Blvd., Skokie, Ill. 60076.

■ **Yourdon Software Engineering Co.** has announced a version of its **Analysis Tool Kit program development software** for the **IBM Personal Computer XT and Personal Computer AT**.

Analysis Tool Kit, originally developed for the Wang Laboratories, Inc. Personal Computer, is a micro-based computer-aided design (CAD) system for software developers. The product reportedly enables systems analysts to create data-flow, entity relationship and state transition diagrams and free-form graphics. The mouse-driven graphics allow the user to create symbolic graphics models for real time, on-line and batch processing systems, the vendor said.

The IBM micro version requires with a high-resolution bit-mapped graphics controller, a 10M-byte Winchester disk drive, 640K bytes of main memory and a graphics printer. Software drivers for the printer and plotter interface are included in Analysis Tool Kit utilities.

Analysis Tool Kit for the XT and AT costs \$3,500.

Yourdon Software Engineering, 1501 Broadway, New York, N.Y. 10036.

■ **Quam Corp.** has introduced its **QC1018 board for networking IBM Personal Computers** under the **Datapoint Corp.'s Arcnet token-passing scheme**.

The QC1018 reportedly is a half-size board for use in a slot in the Personal Computer's expansion chassis.

The QC1018 node and passive hub cost \$449 and \$499, respectively.

Quam, Suite 208, 900 W. 128th St., Minneapolis, Minn. 55337.

■ **Graphics Software Systems, Inc. (GSS)** has announced **GSS-Grafstation communications software** for **microcomputers running Microsoft**

Corp.'s MS-DOS, IBM's PC-DOS or AT&T's Unix.

According to a spokesman, the package allows personal computers connected to host processors to operate as distributed intelligent graphics workstations.

The GSS-Grafstation is priced at \$250.

GSS, 25117 S.W. Pkwy, Wilsonville, Ore. 97070.

■ **American High-Tech Industries, Inc.** has introduced **Magnum MCS-A, a communications hardware and software system** for the **IBM Personal Computer**.

Magnum MCS-A reportedly includes an asynchronous modem and a multifunction board that fits into one of the Personal Computer's expansion slots. Also included is the firm's

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*Trademark of AT&T.

4900 Old Ironsides Drive, M/S 626 Santa Clara, CA 95054.

MICROCOMPUTERS

Turbocom software, which provides asynchronous terminal emulation using character translation.

Emulation of the Digital Equipment Corp. VT52 and VT100 terminals and the IBM 3101 and Data General Corp. Dasher 210/211 terminals is included. Users can also construct any other terminal emulation.

The Magnum MCS-A costs \$1,195, the vendor said.

American High-Tech Industries, Suite 201, 11111 Wilcrest Green Drive, Houston, Texas 77042.

■ **MCI Communications Corp.** has announced Commdesk, a program that allows IBM Personal Computers to access MCI data services while running other applications.

The package works with modems that transmit data at speeds of 110,

300 and 1,200 bit/sec. and is compatible with Hayes Microcomputer Products, Inc. communications protocols.

The software reportedly provides multitasking capability so that a user can run a second application with Commdesk. The package costs \$295.

MCI, 1133 19th St. N.W., Washington, D.C. 20036.

■ **Business Computer Network, Inc.** announced three personal computer software products. Called Telpath, the software replaces Super Scout and includes electronic updating via a toll-free number through the firm's host computer.

In addition, Telpath can be configured with two software upgrades, Telgate and Telmail. Telgate allows users to access most on-line data base services with one keystroke and Tel-

mail lets users send and receive electronic messages by accessing electronic mail services, with a single keystroke.

Telpath sells for \$99.95; Telpath with Telgate costs \$139.95. Telgate is also available as an upgrade to Telpath for \$39.95. Telmail, which is only available as a Telpath upgrade, costs \$69.95.

Business Computer Network, 1046 Central Pkwy. S., San Antonio, Texas 78247.

■ **Percom Data Corp.** has announced a storage and expansion unit for IBM's Personal Computer.

The Expander Plus includes four expansion card slots and can be configured with up to two combinations of Winchester hard disk, removable cartridge or streaming tape backup,

according to the vendor.

The product can be configured by the dealer for any two combinations of 10M-, 20M- or 30M-byte Winchester; 10M-byte ¼-in. streaming tape backup; or 10M-byte removable hard disk drives.

The unit sits on top of the micro and includes a 130W power supply, four ac receptacles, five front-panel control switches, an ac power surge suppressor, a front-panel static discharge plate and space for the two drives. Expander Plus costs \$995.

Percom Data, 11220 Pagemill Road, Dallas, Texas 75243.

■ **Alloy Computer Products, Inc.** has introduced its Microstor-73, an external hard disk drive and tape backup subsystem for the AT&T Unix PC.

The Microstor-73 reportedly integrates a hard disk drive, in a choice of several capacities, with a file-oriented, streaming tape backup unit, giving a formatted capacity of 23M bytes per cartridge.

The Microstor-73 costs \$3,295 for a version with 20M bytes of formatted hard disk storage and \$4,295 for a 40M-byte version. The data encryption chip sells for \$200.

Alloy Computer Products, 100 Pennsylvania Ave., Framingham, Mass. 01701.

■ **Data Technology Corp.** has added several models to its Teammate line of removable hard disk storage subsystems for the IBM Personal Computer and Personal Computer XT.

Each of the units uses removable 10M-byte cartridges, each incorporating a dedicated servo pattern that reportedly permits users to interchange cartridges between compatible subsystems. The cartridges may be removed for storage as well, the vendor said.

Models in the line include the 1400/R102 dual 10M-byte cartridge system, priced at \$3,195; the 1300/R10, an internally installed

Continued on page 58



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MICROCOMPUTERS

Continued from page 57

10M-byte system priced at \$1,695; and the 1400/R10, an external 10M byte system priced at \$1,995.

Data Technology, 2525 Walsh Ave., Santa Clara, Calif. 95051.

■ **Magnetic Memory Corp. has announced a streaming tape backup system for Winchester hard disk drives used with the IBM Personal Computer and Personal Computer XT and AT.**

The ST/20 is said to be a half-height internal tape drive using digital tape cassettes. It includes a controller board for the standard IBM expansion slot and menu-driven software running on Microsoft Corp. MS-DOS and IBM PC-DOS systems.

The cost of the ST/20 is \$795.

Magnetic Memory, 2550 Ninth St., Berkeley, Calif. 94710.

■ **Data Technology Corp. has introduced ¼-in. cartridge tape drives, in externally and internally installed versions, for use in the IBM Personal Computer.**

The Teammate Models 1300/T60 and 1400/T60, both add-on versions, reportedly use 45M-byte or 60M-byte tape cartridges and can conduct a backup at the rate of 5M byte/min. A software utility that permits files to be restored individually or in an image backup is included.

The 1300/T60 costs \$1,395. The 1400/T60 costs \$1,695.

Data Technology, Teammate Division, 2775 Northwestern Pkwy., Santa Clara, Calif. 95051.

PRINTERS/PLOTTERS

■ **Alphacom, Inc. has introduced the Alphapro 401 daisywheel printer, which offers built-in Centronics Data Corp.-type parallel and RS-232 serial interfaces.**

The Alphapro 401 reportedly prints at 35 char./sec. and includes a bidirectional forms tractor feeder. A cut sheet feeder is optional.

Also included is a 2K-byte buffer, expandable to 16K bytes, according to the vendor. The unit supports proportional spacing, boldface, overprinting, superscripts, subscripts and single pass underlining.

The Alphapro 401 costs \$599. The cut sheet feeder costs \$149.

Alphacom, 2323 S. Bascom Ave., Campbell, Calif. 95008.

■ **Princeton Graphic Systems has unwrapped four color monitors for the IBM Personal Computer, Personal Computer XT, Personal Computer AT and compatibles.**

The HX-9 and HX-9E are both 9-in. diagonal red-green-blue (RGB) color monitors with 160mm by 120mm display areas. Each monitor has 20 MHz bandwidth and 0.28 dot pitch, 16 colors and noninterlaced operation. The HX-9E is for use with the IBM Color Graphics Card, the vendor said.

Both monitors are compatible with Apple Computer, Inc. microcomputers with the addition of an RGB 80 card.

The SR-12P is a 12-in. diagonal analog RGB color monitor for use with the IBM Professional Graphics Card or equivalent. It has a 215mm by 160mm display area, 30-MHz video bandwidth and 0.26 dot pitch. Reso-

lution is 640 by 480 dots at 30.48-kHz scan and 640 by 400 dots in emulation mode, the vendor said.

The HX-12E is a 12-in. diagonal RGB color monitor with 215mm by 160mm display area, 18-MHz video bandwidth and 0.28mm dot pitch.

The HX-9 costs \$650, and the HX-9E costs \$750. The SR-12P costs \$999, and the HX-12E is \$785.

Princeton Graphic Systems, 170 Wall St., Princeton, N.J. 08540.

■ **Crosstech, Inc. has introduced a seven-color graphics printer for the IBM Personal Computer.**

The Model CTI-7180 Color Printer reportedly allows combined text and graphics and software-selectable graphics modes of 816, 1,632 and 3,264 dot/line. Text is printed at 180 char./sec. in the pica type style and

90 char./sec. in the near-letter-quality type style.

The software controls individual colors. The unit is priced at \$1,145 with a parallel interface and \$1,295 with a serial interface.

Crosstech, 2720B Aiello Drive, San Jose, Calif. 95111.

■ **Facit, Inc., a subsidiary of L. M. Ericsson, has introduced its 4509 printer for use with IBM Personal Computers or compatible machines.**

Facit 4509 reportedly features two operating modes, a mode emulating the Epson America, Inc. RX-80 printer and an IBM/Epson emulation mode. The 80-col. dot matrix printer prints at 120 char./sec. and includes multiple font and pin graphics capabilities.

Character printing in 10, 12 and

17 pitch reportedly is possible in varying heights. Three resolution settings — 60, 120 and 240 dot/in. — are available for graphics reproduction. The unit costs \$495.

Facit, 9 Executive Drive, Merrimack, N.H. 03054.

■ **Datasouth Computer Corp. has announced its Daisywheel 36 medium-speed letter-quality printer with both Centronics Data Computer parallel and RS-232C serial interfaces.**

The Daisywheel 36 has a maximum speed of 36 char./sec. and an average speed of 32 char./sec. It features bidirectional logic seeking, full stops for each character, proportional spacing, autounderlining and shadow printing.

Red/black printing is available.

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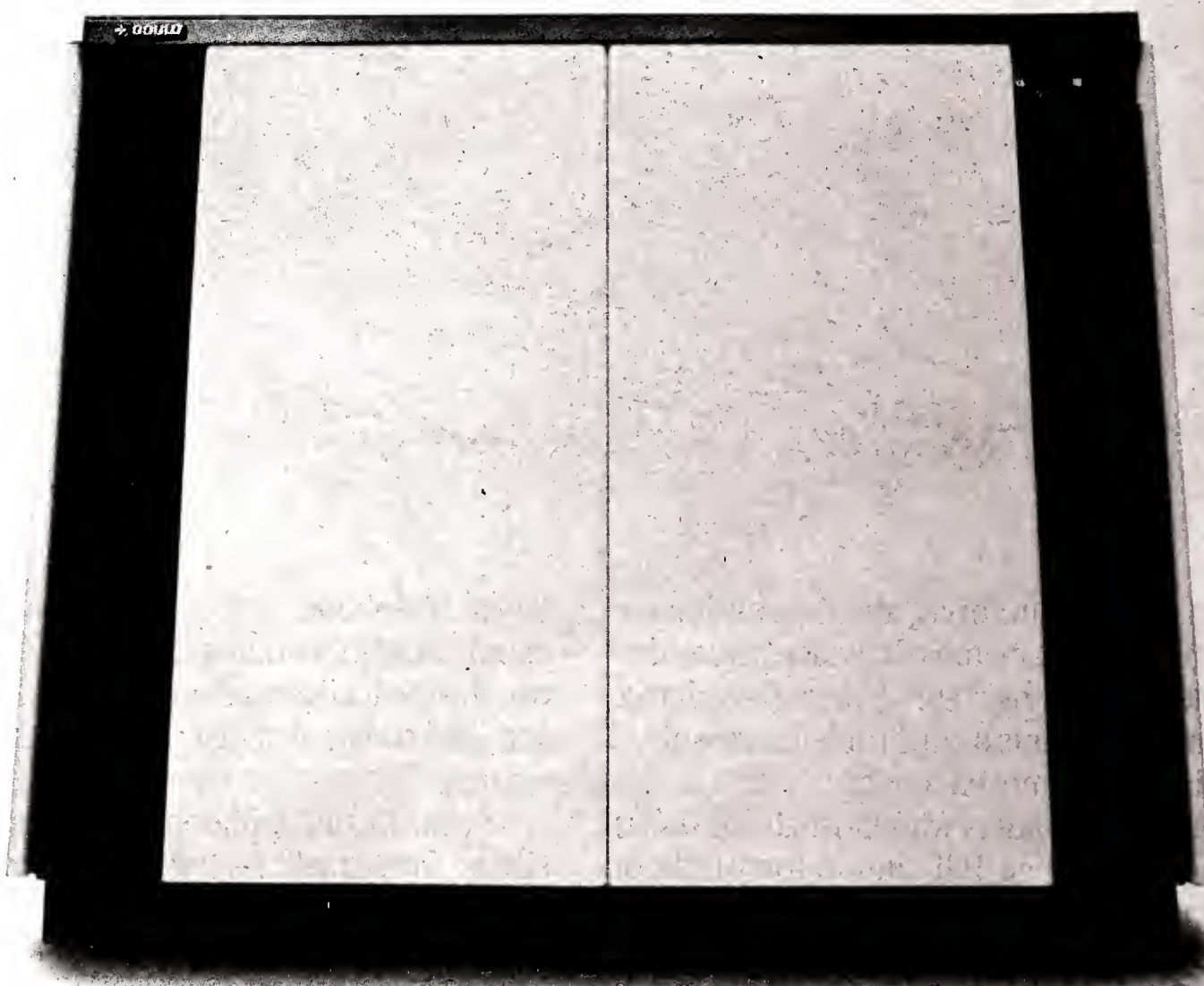
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Only Gould computers have a big enough edge to ax the VAX.



MICROCOMPUTERS

The printer reportedly handles cut sheets up to 16.5-in. wide with a friction feed platen. Options include an automatic sheet feeder and a forms tractor for perforated fan-fold forms.

The printer costs \$995, the vendor said.

Datasouth Computer, 4216 Stuart Andrew Blvd., Charlotte, N. C. 28210.

■ **Ziyad, Inc. has announced Paperjet 400, an automatic sheet and envelope feeder that works with Hewlett-Packard Co.'s Laserjet printer, and Paperjet 2000, a 47 char./sec. daisywheel printer.**

The Paperjet 400 reportedly consists of two paper trays and an envelope tray that are housed underneath the printer. The product holds up to 450 sheets of paper and 75 enve-

lopes. The adjustable paper trays store standard, legal, executive and European paper.

Paperjet 400 sells for \$1,895 and the Paperjet 2000 costs \$4,495.

Ziyad, 100 Ford St., Denville, N.J. 07834.

■ **Sakata USA Corp. has announced a high-resolution amber monochrome monitor for the IBM Personal Computer.**

The Sakata SA-1500 reportedly is 12-in. high and completely portable. It features resolution of 800 dots by 750 dots, a 2,000-char. display, horizontal frequency of 18.43 kHz, vertical frequency of 60 kHz and video bandwidth of 25 MHz.

Cost of the SA-1500 is \$179.

Sakata USA, 651 Bonnie Lane, Elk Grove Village, Ill. 60007.

■ **Wang Laboratories, Inc. has announced a color matrix printer and a daisywheel printer for the Wang Professional Computer.**

The Colorwriter 19 is said to be an eight-color dot matrix printer that attaches to the micro through a parallel port interface and operates in draft, memo and near-letter-quality modes. Print speeds, depending on pitch, range from 154 to 200 char./sec. in draft mode, 90 to 108 char./sec. in memo mode and 30 to 40 char./sec. in near-letter-quality mode.

The PC/WOA-PM015 is a bidirectional, letter-quality daisywheel printer that reportedly prints at 40 char./sec. The product uses a serial RS-232 interface and also operates with the Wang Office Assistant micro.

The Colorwriter 19 is priced at \$1,395 and the PC/WOA-PM015 is

priced at \$895.

Wang Laboratories, One Industrial Ave., Lowell, Mass. 01851.

■ **NEC Home Electronics (U.S.A.), Inc. has announced two 12-in. monochrome monitors that are transistor-transistor logic compatible with the IBM Personal Computer, Personal Computer AT and compatible computers that have monochrome display/printer adapter cards.**

The green phosphor JB-1280DA and amber phosphor JB-1285DA monitors can display 80-char. columns by 25 lines, a spokesman noted.

Video bandwidth is said to be 20 MHz; resolution is 720 horizontal dots by 350 vertical lines.

The monitors cost \$199.

NEC Home Electronics, Suite 10, 700 Nicholas Blvd., Elk Grove Village, Ill. 60007.

MODEL	\$(000)	MIPS/\$
VAX 8600	575	7.6
PowerNode PN9000	400	11.7
CONCEPT 32/97	400	11.7
VAX 11/780	235	4.8
PowerNode PN6030	140	12.1
CONCEPT 32/6730	140	12.1

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GOULD
Electronics

BOARD-LEVEL DEVICES

■ **Thesys Memory Products Corp. has announced Fastcard, a 384K-byte memory board for the AT&T PC 6300. The board is said to expand main memory to a maximum capacity of 640K bytes.**

Fastcard reportedly includes 16 32K-byte dynamic random-access memory (RAM) chips and a 16-bit bus interface for improved read/write access. The product contains 384K bytes of RAM for system use, with an additional 16K bytes for caching and print spooling.

The package also includes the Brightbill-Roberts and Co. Grafix Partner graphics editing software.

The product is priced at \$595.

Thesys Memory Products, 7345 E. Acoma Drive, Scottsdale, Ariz. 85260.

■ **STB Systems, Inc. has announced the Super Res 400 video adapter board that reportedly allows IBM Personal Computer XT and AT users to display high-resolution monochrome text on color monitors.**

The board is said to emulate the IBM Color Graphics Adapter to allow all software to run on a single display monitor. It reportedly works with color monitors with horizontal scan rates of 25 kHz and 640- by 400-line resolution, such as the Mitsubishi International Corp. AT-1341A and Dyneer Corp. 14 CHI.

The Super Res 400 is said to provide users with 32K bytes of video display buffer memory in all text and graphics modes.

The product, packaged with STB's PC Accelerator print buffer and RAM disk utility software, is priced at \$595.

STB Systems, Suite 125, 601 N. Glenville, Richardson, Texas 75081.

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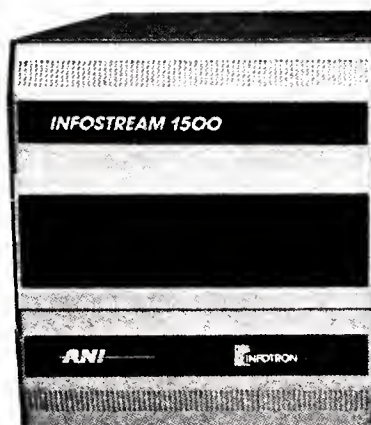
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INFOTRON SYSTEMS

MICROCOMPUTERS

PC-DOS from page 47

specification. Networking software sometimes must find out what and where a server machine is, and this function call provides that information.

The two new commands for end users are Join and Subst (substitute). Of the two, Subst is potentially the most useful.

Join connects a drive to a directory on another drive to produce a single directory structure from two separate directories. Join supersedes the Assign command. Subst allows the use of a different drive specifier to refer to another drive or path.

Both commands have relevance for the general user but greatly simplify some network access within an IBM PC Network environment. The Subst command appears to be particularly useful since it is possible to specify a pseudo drive name to a path specification.

To use the Subst command it is first necessary to use the Lastdrive command in a Config.SYS file so that PC-DOS will be able to deal with more drive names than its normal default. Lastdrive can be set to any character in the alphabet.

On a local-area network the path might go to a network server. On a stand-alone system, Subst allows a program that does not understand paths (Micropro International Corp.'s Wordstar, for example) to actually access a file through a complicated path structure.

Unfortunately, at least one frequently used command, Mode, which has never been very user friendly, must be described as user hostile in PC-DOS 3.1.

Among other things, Mode initializes the serial port or ports. There is no way, however, to obtain a report of the current status of the port assignments. Mode should be able to read the ports and report the current status when Mode is typed without parameters.

When used in tandem with another command, CTTY, the communications hardware apparently is not initialized immediately by Mode until something is shipped to the serial port. Thus, CTTY may appear not to work when, in fact, it will.

Another minor complaint is that the numerous references in the PC-DOS 3.1 manual to the technical reference manual suggest that the two should be packaged together even for casual users.

Without the technical reference book it is not even possible to use or understand the Ansi extended screen and keyboard control, which can be useful in constructing batch commands, among other tasks.

On the other hand, except for a few minor glitches, the documentation is complete and attractive.

On the whole, PC-DOS 3.1 seems to have taken care of most of the problems in Version 3 and extends considerably its power over all PC-DOS 2 versions.

The new version is likely to run directly on some compatibles. I tested PC-DOS 3.1 on both a Personal Computer XT and a Tandy Corp. Model Tandy 1200HD. It worked equally well on both machines.

RUNIT from page 47

memory and PC-DOS 2 or higher.

Mailit, priced at \$300, was designed to simplify electronic mail and other office automation tasks for companies with IBM mainframe-based electronic mail systems, according to ITS Software.

The initial release works with IBM's Scripts and Professional Office System (Profs) and DCA and CXI emulation boards.

Mailit is said to translate documents prepared with a microcomputer word processor into IBM formats. Additionally, it permits nondocument files, such as programs and data files, to be sent to and from the mainframe for routing to other personal computer users via Profs, the vendor said.

The software requires 128K bytes of internal memory and PC-DOS 2 or higher.

More information is available from Martin Marietta Data Systems through P.O. Box 2392, Princeton, N.J. 08540.

SATURATION from page 47

more measured."

While Cigna's micro purchasing hasn't slowed substantially in the past year, a random — and statistically insignificant — round of interviews earlier this month generally found significant declines.

Microcomputer purchasing "has slowed down dramatically since the first of the year," reported the MIS manager at a large East Coast consulting firm. "There's no corporate policy on it; it's starting at the bottom of the company. There's just no demand." After buying many systems last year, "we went to a level of saturation," he said.

In the early days of corporate personal computing, even highly paid employees would wait to use a machine, but "nobody's standing in line anymore," said Ron Goldfarb, office automation manager at Pratt & Whitney Co. in East Hartford, Conn.

"That goal of one [personal computer] per person seems further off than it did a year ago," he added. "Maybe we don't need one [personal computer] per person."

For many firms, the next step for desktops is a plunge much further into the deep waters of office automation, networking and distributed computing. These are dangerous waters and not everyone likes what they find when they dip a toe in.

Among the biggest corporations, "a very, very large contribution to the slump is the lack of delivery on announced products," said Thomas Billadeau, founder of TRB & Associates in Ogunquit, Maine.

Office products often arrive not only late but oversold, and customers have grown very skeptical in the past few years, he said.

"End users are more involved in the decision-making process, and they're more impatient than people who've been involved in the industry for years," Billadeau maintained.

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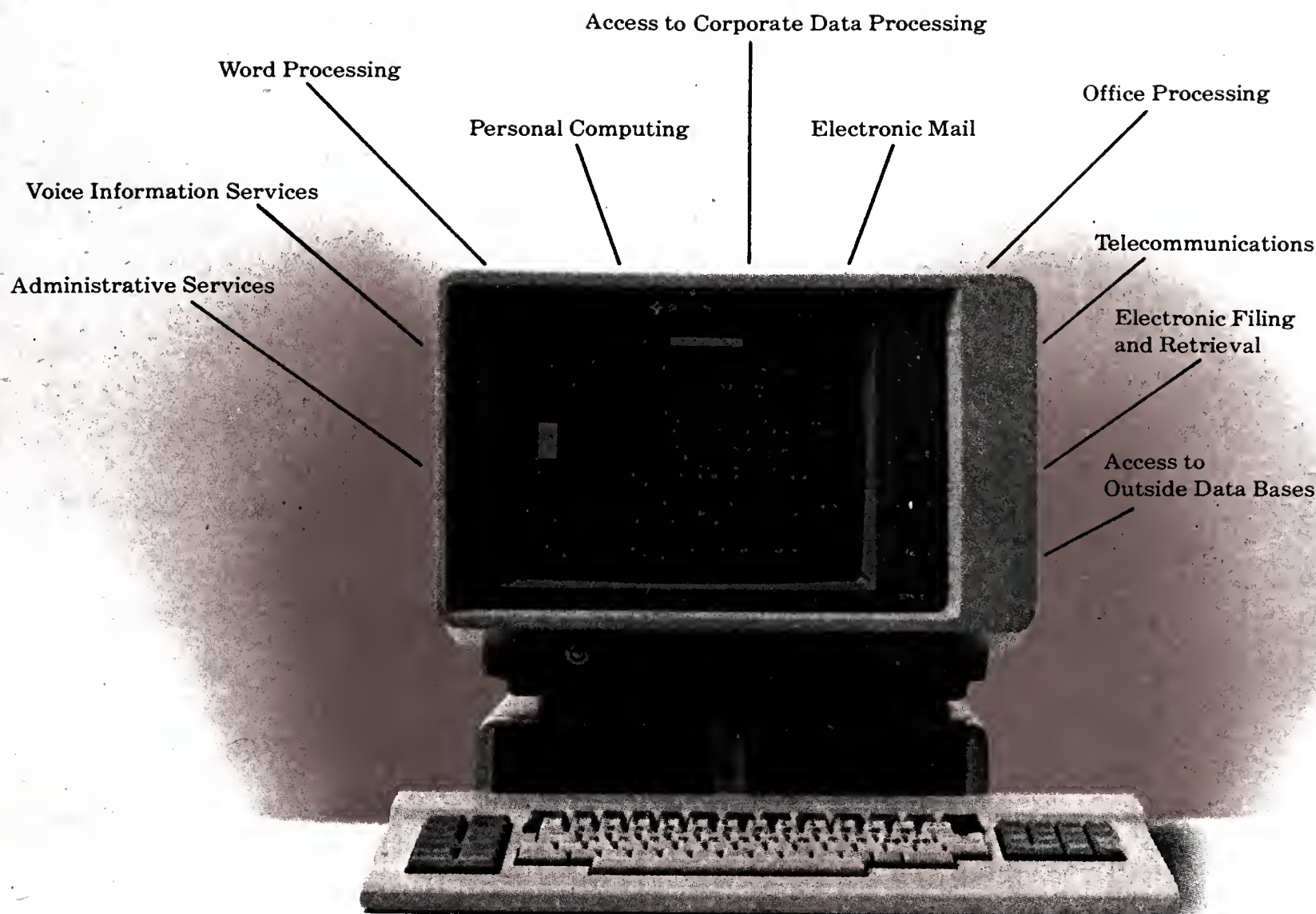
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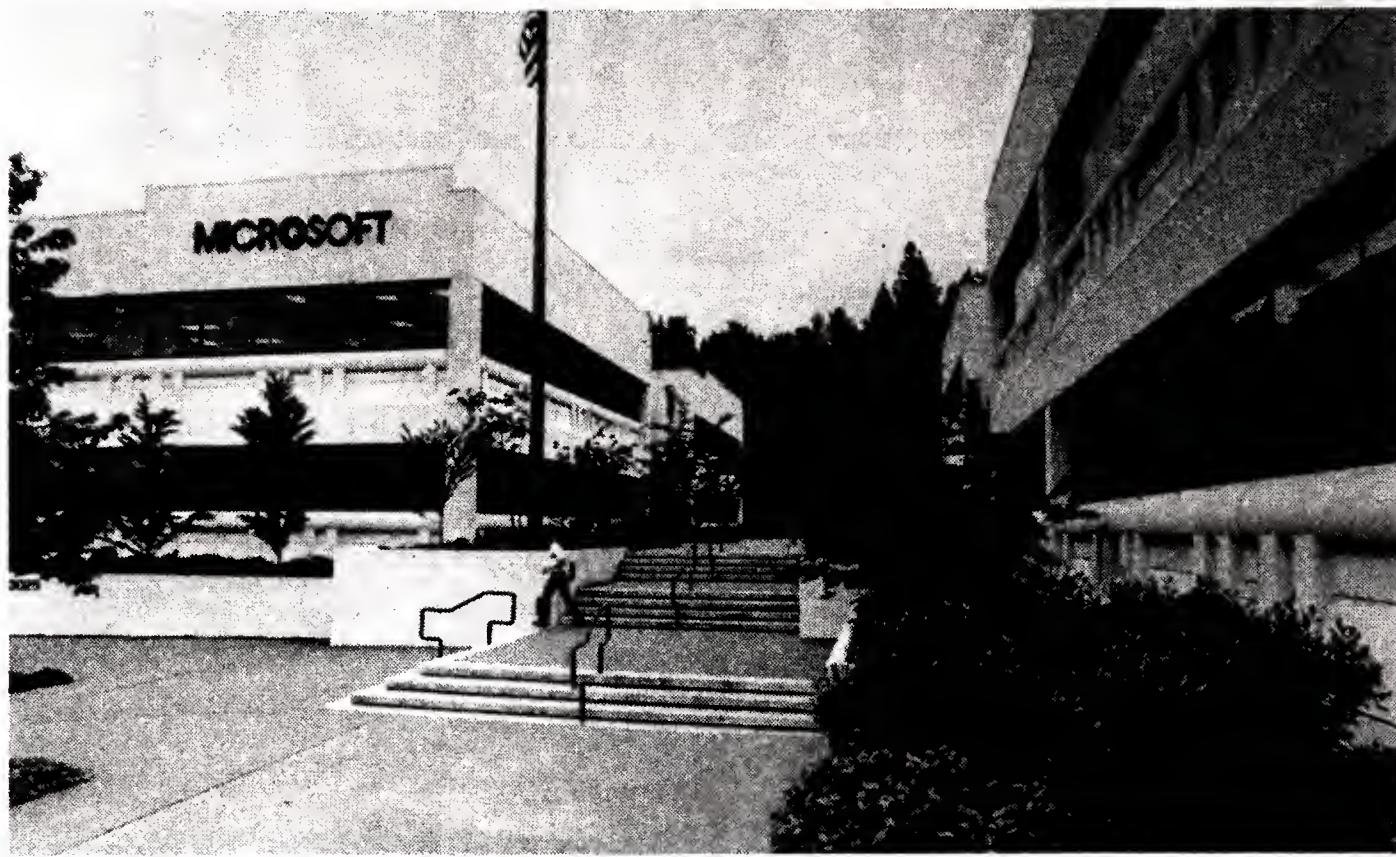
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IN DEPTH



CW PHOTO BY KATHLEEN SULLIVAN

Growing up with MS-DOS

Kathleen Sullivan
CW West Coast Bureau

At the outset, IBM's head of corporate relations explained why he had come along. It was because "this is the most unusual thing the corporation has ever done." Gates thought it was about the weirdest thing Microsoft had ever been through, too. Once again, Gates, Ballmer and the other Microsoft attendees had to sign a legal document, this time stipulating that they would protect in confidence anything they viewed at the meeting. Then they saw the plans for Project Chess. IBM was going to build a personal computer.

— from *Fire in the Valley* by Paul Freiberger and Michael Swaine

In the annals of the personal computer industry, this meeting would be recorded as a momentous occasion.

Mainframe powerhouse IBM had gone courting, looking for a microcomputer software virtuoso. Its search ended in the evergreen forests of the Northwest, where a young programmer named Bill Gates ran a company that sold personal computer languages.

In August 1981, when IBM entered the market with its Personal Computer, the importance of this earlier rendezvous would become clear. Every computer rolling out the IBM factory doors carried the imprint of Microsoft Corp., which was outfitting IBM's machine

with its 16-bit operating system.

By 1985, the creator of MS-DOS was celebrating its 10th anniversary, an event that made it an elder statesman in the personal computer industry. Unlike many companies felled by competition, Microsoft has prospered, charting impressive gains each year (see chart ID/4).

In revenue, Microsoft is the second largest independent microcomputer software company. Lotus Development Corp., the Cambridge, Mass., firm that catapulted to the top of the market with its 1-2-3 spreadsheet program, has led the field for the past two years.

Although the No. 1 position eludes Microsoft, the company has built a solid foundation for future growth by developing a diverse product line. Expected to post revenue of \$150 million this year, a \$40 million increase over 1984 levels, Microsoft enjoys some advantages over rival Lotus.

"In the long run, Microsoft is in a stronger position than Lotus because it is the only independent company that has been successful in systems software as well as applications products," says Bob Lefkowitz, an analyst with Infocorp, a Cupertino, Calif.-based market research firm. "That means Microsoft will be in control of its own destiny on both sides of the shop."

Currently, Microsoft's revenue is drawn equally from its systems software
(Continued on ID/4)

MICROSOFT

IN DEPTH

A conversation with Bill Gates

What are your present responsibilities at Microsoft?

Our goal is to get a workstation running our software onto every desk and eventually in every home. A lot of the vision of how we get there in terms of evolving the hardware, the software and the tools we will use is my responsibility.

What issues are important to your key customers?

They want the same thing we want. They want to see a workstation on every desk top. They want to keep this a growing business that attracts whole groups of end users that we haven't had yet. We're all focusing on issues related to networking and to a graphical user interface.

As you know, we moved up to the [Intel Corp. 80286] for a lot of the systems, and the [80386] comes after that. There are some exciting things with custom graphics chips and the new types of screens, where we have to get software not to be dependent on that stuff. That ties in pretty closely with what we're doing with Windows.

What does Microsoft hope to accomplish with Windows?

Commonality is one of the things we're missing in a big way. Once the stuff is common, everything is going to be identical, whether it is the way you start something up or switch or scroll or select a menu. That's one of the primary goals of Windows. We didn't see any way to get that with the current generation of applications, because some of them are so popular. Why should somebody change unless there was something really new? We've gotten a strong reception because everyone agrees that the

"We're a multiple-product microcomputer software company. We've never believed that any single product is key to our future; rather, it is our tools, our approach, our reputation, our people. There's no single product at Microsoft that's even close to 15% of our revenue."

hardware — the display, the graphics chips, the printers — are going to be there.

Why is a graphical interface important?

There have to be a variety of common tools that are used in common situations, so that everybody builds on top of those common tools. If you're still talking about a spreadsheet where you have to know to put a formula in a cell and to make this variable refer to that variable, there's a certain level of complexity that exists there, irrespective of how much sugar coating there is with a great user interface. So we think it's crucial to get a graphical user interface.

Once we're there, we'll focus on other questions. Do you have to think of your data as being in separate files? Do you have to remember which application built it? Do you have to know which data relates to other data, or will you be able to refer to it more like you would in talking to a human — for instance, the financial officer about financial data?

Windows was first announced in November 1983, but its release has been delayed several times. Has Windows been eclipsed by other products?

No other product has gotten any significant number of third parties to build graphical applications. In our systems software group, we are building the pieces that are important for people to build applications on. So we're ahead of where the needs are because we need to build our foundation well in advance.

IBM just introduced the [Personal Computer] AT, which has that really super level performance. Six months ago, IBM introduced the Extended Graphics Adapter, and it's just starting to sell.

To do graphics, the more performance you have, the better off you are. You need things like laser printers and pointing devices. If you look at the trade-off between character-oriented applications and graphics applications, it's only with extra speed and resolution that you can start to say everything will eventually be graphical.

How has Microsoft changed over the past year?

Our systems group has about doubled in size over the last two years. The company two years ago had about 250 employees; today it has 900. We've been very successful in applications and have met our goals in that area.

We have this product philosophy of depth applications. Programs like Project, Chart and Access are very serious depth applications. I think that philosophy is being more accepted.

The all-in-one type of philosophy is less successful than many people had anticipated, particularly as we get to environments like Windows, which allow multiple applications to work together and exchange data.

(Continued on ID/10)



IN DEPTH/MICROSOFT

group and its applications group, according to Bill Gates, Microsoft's 29-year-old chairman and chief executive officer. Once known primarily for its work in languages and operating systems, Microsoft has also demonstrated its success as an applications developer.

"Applications is an area of high growth for us," says Gates, whose fascination with computers surfaced in the late 1960s while he was still a teenager in Seattle. As a high school student, he worked — without pay — debugging programs in a local firm's Digital Equipment Corp. mini-computer.

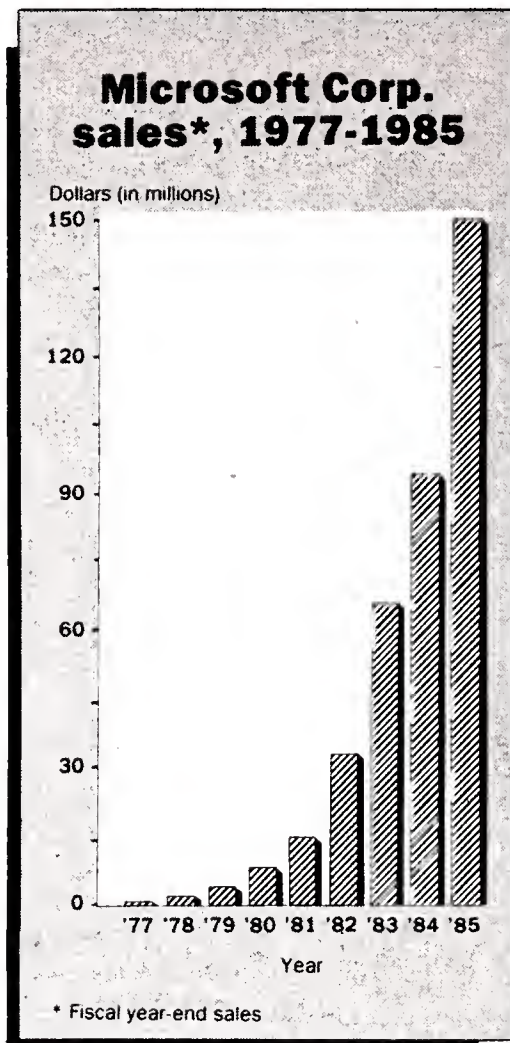
The company Gates started in 1975 with friend Paul Allen recorded its first sale when the two sold their Basic to Micro Instrumentation Telemetry Systems, manufacturer of the Altair computer.

Microsoft and Macintosh

Today, Microsoft is ringing up sales of applications software. The firm has found particular success with packages for the Apple Computer, Inc. Macintosh.

"We've sold more than one application for every Macintosh that's been sold," Gates says. "You can look at any personal computer at any time anywhere — there's nobody that's ever sold one application onto every single [computer]. Not even close."

The company recently surprised the industry with Excel, a spreadsheet package for the Macintosh. When Excel was announced the first week of May, Microsoft stole some thunder from Lotus, which was late



in delivering its long-anticipated Jazz integrated software program.

Yet one accomplishment in the applications arena still eludes the firm, according to Jon Shirley, Microsoft's 47-year-old president.

"We need to have a hit applications product in the DOS marketplace," he says.

Microsoft Word has come close,

but it hasn't achieved the kind of "hit status" Shirley is looking for. "I'd like to be able to say unequivocally that something is number one," he says.

Shirley, a 25-year veteran of Tandy Corp., became Microsoft's president two years ago. When he arrived, his primary task was to bring order to what had been a loosely run company.

"At the time, Microsoft was essentially run by Bill, who liked to spend his time on technical matters, not on matters related to running the company," Shirley says.

Today, Shirley handles the day-to-day business matters of the growing firm. Microsoft now employs about 900 people, having added 300 workers to its payroll since 1984. Next year it will move its staff into new quarters on a 53-acre site in nearby Redmond, Wash.

In an industry that thrives on creativity and an entrepreneurial spirit, increasing size could present problems. So Microsoft makes an effort to keep bureaucracy from creeping in, Shirley says. For Microsoft employees, that means Friday afternoon beer busts, companywide meetings, flexible working hours and ongoing technical sessions.

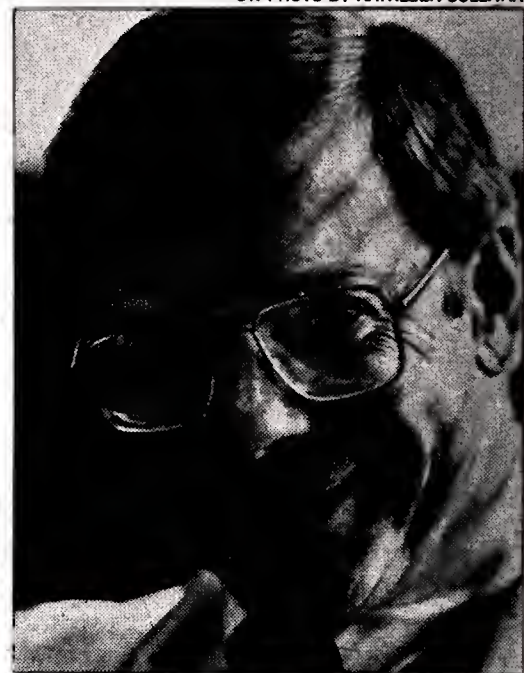
"We try not to let the business of running the company change the way we do software," he explains.

At its sprawling headquarters in Bellevue, Wash., Microsoft has assigned each programmer a private office, which can be decorated to the person's tastes. Many are colorful; some boast impressive stereo systems. When working on unannounced

products, the windows that open onto the common hallway are papered over or draped with fabric.

Projects are organized around small groups of people, Shirley says. "We believe good microcomputer software is done by small numbers of people. The largest development

CW PHOTO BY KATHLEEN SULLIVAN



Jon Shirley

group at Microsoft is the Windows group, which got up to 22 people. Even in that group, the people were split into four separate modules."

Windows

Windows, an extension to the MS-DOS operating system that seeks to provide a graphics user interface, was introduced with great fanfare more than a year and a half ago.

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IN DEPTH/MICROSOFT

Microsoft has endured criticism for the project's many delays and postponed delivery dates.

In June, Microsoft finally released Windows to hardware manufacturers and independent software developers. A retail version will be readied within the next several months, says Steven Ballmer, the company's vice-president of systems software.

Since Windows was first announced in late 1983, IBM and Digital Research, Inc., the Pacific Grove, Calif., firm that created the CP/M operating system, have joined the fray. From Shirley's point of view, however, neither product stands up as a worthy competitor. "Of those two products, Topview is clearly a failure, and Gem is relatively unambitious in its goals," he notes.

According to Kathleen Lane, an analyst with Dataquest, Inc., a market research firm based in San Jose, Calif., Windows faces an uncertain future in an unproven market. "With Windows the question is, 'Who wants it?'" Lane says. "The market has not yet decided the acceptance of this type of product."

Although Gates is sure that Windows will generate enthusiasm, he says it is sometimes hard to describe the benefits of a graphical interface to the uninitiated. But the level of skepticism would be dramatically higher if it weren't for the existence of the Macintosh, he says.

"Having seen the Macintosh, people can imagine, 'Wow, this is going to be great!' It will have all the benefits of DOS and have something that, in fact, even goes beyond what the Mac's doing in terms of being a multiple applications system and working with color," Gates says. "[Windows] is a super, complete system that goes beyond what people have seen."

Gates concedes that the problems the company had encountered in meeting its original deadline for Windows were unfortunate. But the product will be able to stand on its own merits, he says. "Any product lives on its quality once it comes out," he notes.

Infocorp's Lefkowitz was also optimistic. "Even though it's late, it will be competitive with Topview," he says. "Windows will be a product to be reckoned with."

Lefkowitz does not expect Microsoft to suffer as a result of its delayed shipment of Windows. But the company's credibility could be compromised if its relationship with IBM changes.

"If the bloom goes off the rose, and IBM adopts a proprietary operating system or stops working with Microsoft, that will hurt the firm,

”

'Some people still see the software industry as a flash in the pan. But the innovative group of companies that have taken the long-term approach will prove to the world that the software industry is a great thing.'

even though its base is strong."

Both Gates and Shirley dismiss speculation that IBM might abandon its open systems approach. In August, when IBM introduced the Personal Computer AT, it chose Microsoft's Xenix operating system as well as the newest version of MS-DOS for the machine, they note. "IBM is enthusiastic about where we're taking DOS," Gates says.

Microsoft has a number of objectives regarding future versions of MS-DOS, according to Gates. "It's safe to assume that Microsoft will introduce a multitasking version of DOS, but we're not ready to announce it yet," he says. The firm is also devoting its efforts to getting around the current 640K-byte address space limitation of DOS and adding protection, Ballmer adds.

Whether the issue is enhancements to DOS or new applications programs, most analysts believe Microsoft is prepared for the long haul. "We're not at a point where we're going to see a stable industry," notes Dataquest's Lane. "There are still huge, huge steps in technology to be taken that will require a lot of research and development."

The firms that will thrive will be those that are able to adapt to change. "Microsoft is perceived as a company that has always had vision," Lane says.

The next three to four years are crucial, Gates agrees. "Some people still see the software industry as a flash in the pan," he said. "But the innovative group of companies that have taken the long-term approach will prove to the world that the software industry is a great thing."



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IN DEPTH/MICROSOFT

MIS at Microsoft: Building from the micro up

Sitting in a sunny conference room a few doors away from the computer systems room, Neil R. Evans, Microsoft Corp.'s director of corporate systems/MIS, recalls his first impressions of the company.

"When I came to Microsoft two and a half years ago, it was chaos," he explains. "They really didn't know what MIS was when I first arrived."

At the time, the firm was doing its bookkeeping on a personal computer and handling inventory control through a time-sharing service. It had no business plan to serve as a guidepost for its next phase of development.

"The company had no capacity

planning for personal computers, electronic mail or MIS," Evans says. "It was a situation of uncontrolled growth."

The situation presented a unique opportunity for Evans, who left a job as application development manager at DEC's disk manufacturing plant in Colorado Springs, Colo., to work at Microsoft. In his new position, he would be able to build a data processing department from scratch.

Under Microsoft's president, Jon Shirley, a blueprint for growth was put in place. It was a critical step, Evans says. "A system reflects the business and should be keyed to the business. Our ability to plan for growth is only as good as the busi-

ness' ability to plan. The MIS department has to know the key issues."

Even during his short tenure, the changes have been significant. "Before, it took 40 days to close the general ledger and publish the monthly financial statement," he says. "Now it takes 10 days. It used to take three weeks to complete and ship an order. Now it takes only one to two days."

Managing Microsoft's computer systems has proven to be challenging, because the company is more dependent than most on its computers, Evans says.

"The systems here are a life-stream system," he explains. "If they weren't working, the company

couldn't run." Of its approximately 850 employees, 500 have personal computers, and all personnel — including workers in six foreign countries — are tied into the firm's Xenix-based electronic mail system.

According to the 37-year-old Evans, his primary challenge at Microsoft is coping with the intensity of the company's work environment. "It's a double-edged sword," he says. "In this company, you're more needed, but you're also more under the gun."

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*'The systems here
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system. If they
weren't working,
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couldn't run.'*

"Users at Microsoft are overly demanding," Evans says. "They're impatient. They're intense. They're used to getting instant gratification, because they work with personal computers and expect fast feedback."

Two systems groups

There are two systems groups at Microsoft: corporate systems and MIS. All personal computers, electronic mail systems and software development machines fall under the corporate systems group; accounting, order entry, distribution and manufacturing systems are managed by the MIS staff. Twelve people work in the corporate systems group; 18 handle the MIS operation.

At Microsoft, each software programmer has an IBM Personal Computer AT; the developers also share workstations designed by Sun Microsystems, Inc., a Mountain View, Calif.-based firm.

In the MIS department, Microsoft has installed two DEC VAX-11/780s. The company is using Maxcim, an integrated financial, distribution and manufacturing program developed by NCA Corp. Next year, Evans says, the firm plans to trade in the systems for a VAX 8600, which would double the MIS group's computing power.

Evans says his experiences at Microsoft have changed his outlook on how a company should manage its computer systems. "Working here has opened up my ideas of who should use computers and how they should be controlled," he says.

In general, he notes, a firm's systems can be divided into three categories, each with a different level of control. Although there should be very strict controls on access to corporate data base — no uploading of information, for instance — the policies governing departmental computers should be less restrictive, and computers should be only loosely controlled.



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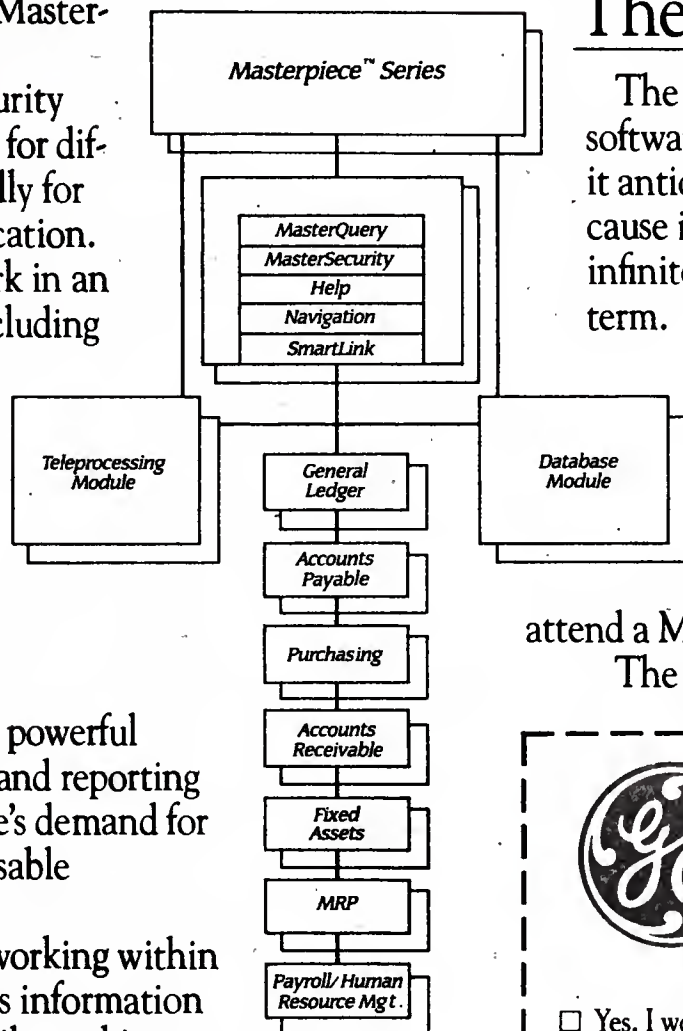
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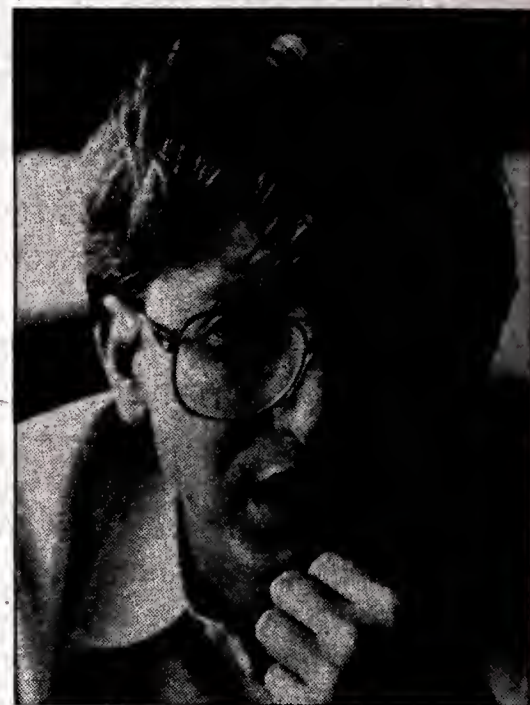


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— Bill Gates



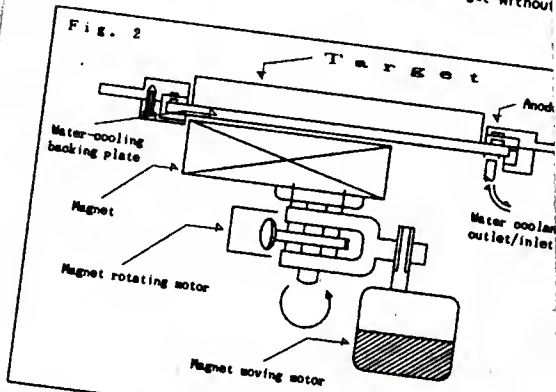
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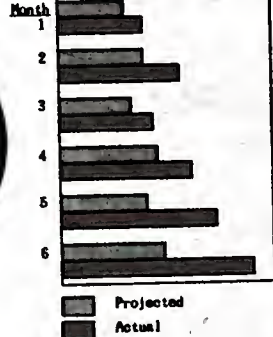
With the exception of an expected dip in March, monthly revenue continues to increase. Given our current growth rate potential, we now expect to exceed sales of \$1,500,000 year end.

The bar graph below dramatically indicates our revenue and the improvement over projected sales. The pie chart indicates revenue generated by district.

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Revenue (000)



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(Continued from ID/3)

In Europe, we have the most successful applications; our Multiplan spreadsheet is No. 1 in France, Germany and Japan. Our Macintosh software line is incredible. We continue to have very ambitious plans in the applications area.

What kinds of ambitious plans?

Mainly those plans have to do with getting the applications really using networks and helping people to use the benefits they can get out of that.

Also, getting our applications to use graphics more; using the newer version of DOS; doing data interchange the way that Windows supports it. There are a lot of fairly clear things that users are asking for.

One analyst says the biggest challenge facing Microsoft during the coming years is finding quality software to bring under its label. What is your reaction to that statement?

I don't think that's a problem. We already have a very complete product line that we're committed to evolving.

We've always had the philosophy of training people to use our proprietary development techniques instead of just relying on getting people who already have a way they want to do things. That's worked very effectively for us.

We're a multiple-product micro-computer software company. We've never believed that any single product is key to our future; rather, it is our tools, our approach, our reputation, our people. There's no single product at Microsoft that's even close to 15% of our revenue.

When do outside acquisitions make sense for Microsoft?

When you take something that requires expertise that we don't have, where you get some brand name support and you get to work with somebody who really knows what they're doing, like our work with AT&T on Unix.

The guys who worked with us on the Access communications program had done mainframe communications work for about eight years. We also have a certain set of projects we decided to do in-house; things like Word and DOS and Windows are totally in-house developed.

If I see a really good product that we can integrate with our data exchange strategy, align with our user

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interfaces and offer with international support, then there are some good opportunities. Our licensing stuff has worked out very well for us. We've always believed in the mixed model. We'll continue to have that balance.

Does Microsoft have in-house expertise on artificial intelligence?

Yes. We're the most active in that area as far as a microcomputer software company goes. It's our future work. It's something that I'm personally pretty involved in.

The opportunity to blend our success as a company that offers software out in the commercial world with these AI techniques is very exciting, particularly since we're now in a position to influence hardware architecture so that it will work well for that.

We take a very pragmatic approach to how we can apply learning techniques to productivity packages. They could be running on present-day hardware in less than two years. These learning techniques can help us get over the low-level things that machines can't do today, things that make them real troublesome to work with. That's what we call softer software.

What will softer software let us do that the current generation of software will not allow?

Present-day software doesn't allow you to refer back to previous actions and say, "Let's do what we did at the end of the month last time, but this time let's do pie charts on each of the regions, and let's do an in-depth breakout on the products that lost money." You can't communicate like that. You have to say, "OK, which file did I have, which record is it in, which tools should I

”

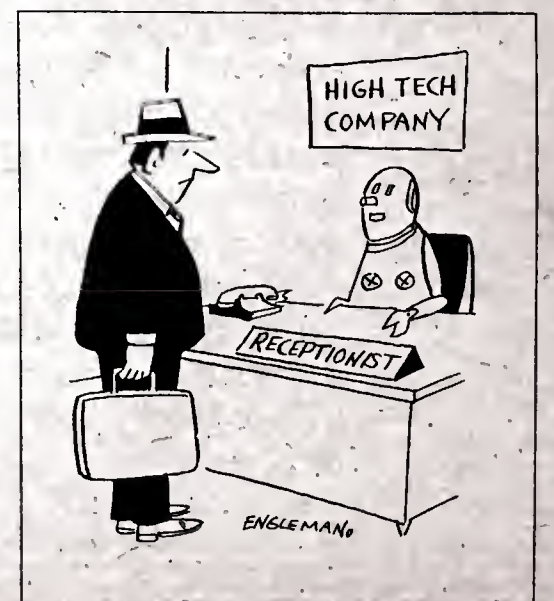
We take a very pragmatic approach to how we can apply learning techniques to productivity packages. . . . These techniques can help us get over the low-level things machines can't do today, things that make them real troublesome to work with. That's what we call softer software.

use, what graph command should I give again that I gave last month?"

In softer software, the fact that you've done something before allows you to refer back and explain how you want to do things differently in terms of high-level concepts. It requires a view of data that doesn't exist yet. And it requires a degree of pattern-matching activities that don't exist yet. It's hard stuff.

Does softer software bear any resemblance to expert systems?

No. Expert systems don't learn. They are a fixed encoding of the knowledge of an expert into a programmatic tool. That's a different thing. What you have now is just rote. If you want to do exactly the same thing to exactly the same data, then you can use things like keyboard macros. But there's no flexibility there; it's just rote repetition. In truth, no, there's nothing like softer software out there today.



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IN DEPTH

Managing The Software Crisis

Part 2

By Ken Orr

Software development is in a state of flux. Information systems managers have too much to do, too little time to do it, too few people and too many options. Among the suggested solutions are systems development methodologies (SDM) and fast-track development approaches based on the use of fourth-generation languages and rapid prototyping.

In part one of this series last week, I discussed the evolution of various competing systems development approaches: traditional, structured, process-oriented, data-oriented and fast-track. In this second part, we will look at representative experiences of large organizations in dealing with the move from traditional implementation tools such as Cobol, Fortran and PL/I to fourth-generation languages and fast-track development.

In addition, we will look at strategies for integrating fourth-generation technology

IN DEPTH/SOFTWARE STRATEGIES

with structured SDMs and consider the possible impact of computer-aided software engineering (Case) tools on software development in the near future.

Almost everyone has seen write-ups in the technical journals on some major success using one methodology or another. I will not attempt to recap those stories here. Rather, I will cite three to draw some conclusions, perhaps, about the effectiveness of the various approaches to systems development.

A fourth-generation pioneer

Our first example is a Fortune 500 corporation that pioneered the use of fourth-generation languages. Frustrated after years of difficulty with the centralized information systems organization, the management of one of the large user organizations within the corporation persuaded top management to try a new approach — using a new user-friendly language on a different computer, one dedicated to a single application.

Top management agreed, and the user organization put a team of bright users together to build its own system. The experience was a major success. The application was completed largely without the help of the centralized information systems department and within a very short time. The system itself enabled the organization to improve clerical operations and to reduce the clerical staff throughout the corporation.

As a result of this success, the corporation began to introduce fourth-generation languages to an ever-widening user and data processing framework. But application of the languages on the core or "back-bone systems" was restricted to those that could be safely interfaced with the corporate data base. The major functions that updated the corporate data base were still developed using more traditional third-generation languages and data bases.

A year or two ago, information systems management, by now composed of the same people who had brought the fourth-generation systems into the organization, found they needed some way to integrate the control techniques. The organization then installed a data-oriented SDM to control the management of information systems throughout the company.

A fourth-generation follower

Our second example, a government organization, shows what can

happen when a new technology is employed without an understanding of its strengths and weaknesses and without good management.

In this case, information systems management attempted to develop a production payroll system on an extremely short deadline.

Here, the ease with which a fourth-generation language could be applied justified a fast-track development schedule. But because of user pressures, information systems management threw away the textbook — there was very little in the way of requirements definition, design or documentation. Although the initial version met the schedule, there were problems after the system was installed.

The first sign that something was seriously wrong came when the organization attempted to bring up one of the major organizational entities on the centralized payroll. This entity had a great many temporary employees, and the system simply couldn't handle the data. This inability caused considerable embarrassment for the information systems organization, because the difficulties were reported in the newspapers.

The next and fatal problem occurred when information systems management had to go back to top management and ask for another computer. Just two years earlier, they had recommended the purchase of a \$5 million computer to run the fourth-generation system. It was supposed to last from seven to nine years.

Now, information systems management was back, hat in hand, asking for another computer — only this time the price tag was \$12 million to \$15 million. The increase in computer requirements could be traced directly to the inefficiencies of the fourth-generation language that had been used to implement the system and to the limitations of the data base available with the language.

Needless to say, top management was not pleased. Outside consultants were called in, and consequently, the information systems director left.

The best of both worlds

The third example, also a government organization, uses fourth-generation languages in conjunction with a data-structured SDM, with very encouraging results. Over the last five years, productivity has increased by more than 300%. Management attributes this success to the

Fourth-generation process-oriented waterfall

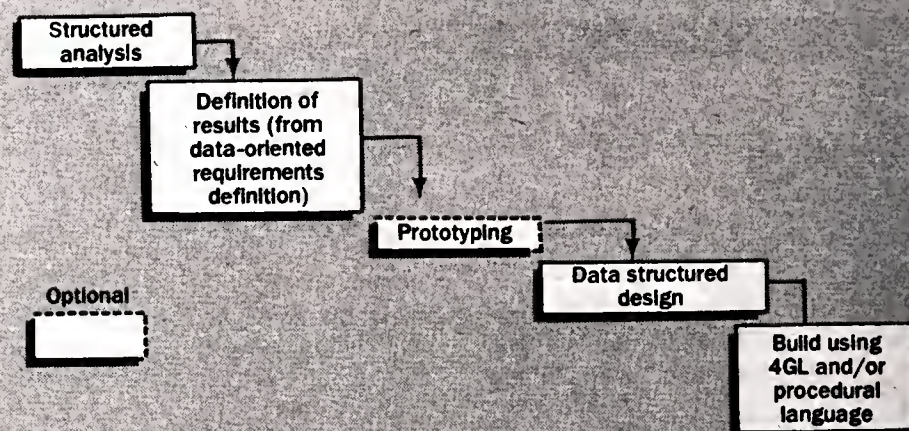


Figure 1

Fourth-generation data-oriented waterfall

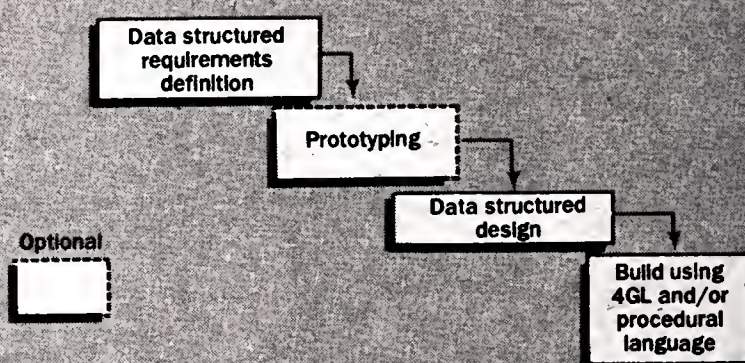


Figure 2

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adoption of a consistent design approach: a data-oriented SDM coupled with implementation through a mixture of an efficient fourth-generation language, Cobol and CICS.

The manager of the organization says, "Because of the power of [fourth-generation languages], there is the danger that users and programmers will begin to avoid doing requirements and design. Our experience has been that if anything, the need for good requirements and design is greater using [fourth-generation languages] than using traditional languages.

"We've experimented with prototyping," he adds, "but we plan to use it only for very small applications, especially where the problem is very uncertain. We're convinced that prototyping is a tool, not a panacea."

Winners and losers

In the world of fourth-generation information systems, there are winners and losers. The first and third organizations are clearly winners in the use of fourth-generation techniques, and the second is a loser. Why? The differences have to do with management's understanding of software development.

In the first and third organizations, management understood that fourth-generation tools and techniques offered the opportunity to improve performance dramatically, particularly in the build and test phases. But they also recognized the need for disciplined development using SDMs to ensure that critical factors would not be ignored in the rush to implement.

SDMs were created, in large part, because those involved in developing systems recognized that good systems require a number of things that are not immediately evident to their users or to inexperienced analysts and programmers. Among these key elements are requirements and design documentation, back-up and recovery procedures, security, controls and audit trails.

The indiscriminate use of fast-track development techniques produces gains in productivity primarily by omitting many of these items, items that the school of hard knocks has taught experienced software managers to build into their systems. While such omissions may or may not be acceptable for small, personal systems, they are clearly unacceptable for the major backbone systems of the organization.

Future directions

It is clear from our experiences that tools such as fourth-generation languages, prototyping and high-speed analysis have a place in modern systems development. Indeed, any tool that makes it possible to speed the requirements, design, implementation or maintenance process is truly valuable.

In many organizations, however, fast-track development techniques have been sold without qualification. Experience indicates that fast-track development works best on small to medium-size systems. On large systems or on systems where performance is a critical issue, fast-track techniques and tools can still be used, but they must be used with caution.

One organization with whom we work made a commitment to using fourth-generation languages for all new development, only to find that

in cases where performance was an issue or where there was a great deal of complex computation, it had to resort to Cobol. In the end, approximately 60% of the finished product was done in a fourth-generation language and the remaining 40% in a mixture of second- and third-generation languages.

Recommendations

Today, we are recommending to our clients that they adopt a data-oriented SDM with a framework that allows for the integration of high-speed analysis, prototyping and fourth-generation languages within a controlled life cycle (Figure 1). Doing so ensures that the major elements required for quality software development are present. The data-oriented methodology should have a strong logical data base component.

If the organization is currently using and/or committed to a process-oriented SDM, we recommend that it integrate its structured analysis with a state-of-the-art logical data base design methodology (Figure 2).

We are also recommending that our clients begin planning to install Case tools to aid in the requirements definition and design phases of their systems. Moreover, we recommend that they plan to interface these tools with system and program generators as well as fourth-generation languages (Figure 3).

In many respects, the information systems field is confronting the same problem faced by car manufacturers. In the late '70s, U.S. automobile companies found that to meet Japanese competition, they not only had to produce cheaper, more advanced cars more quickly but also had to

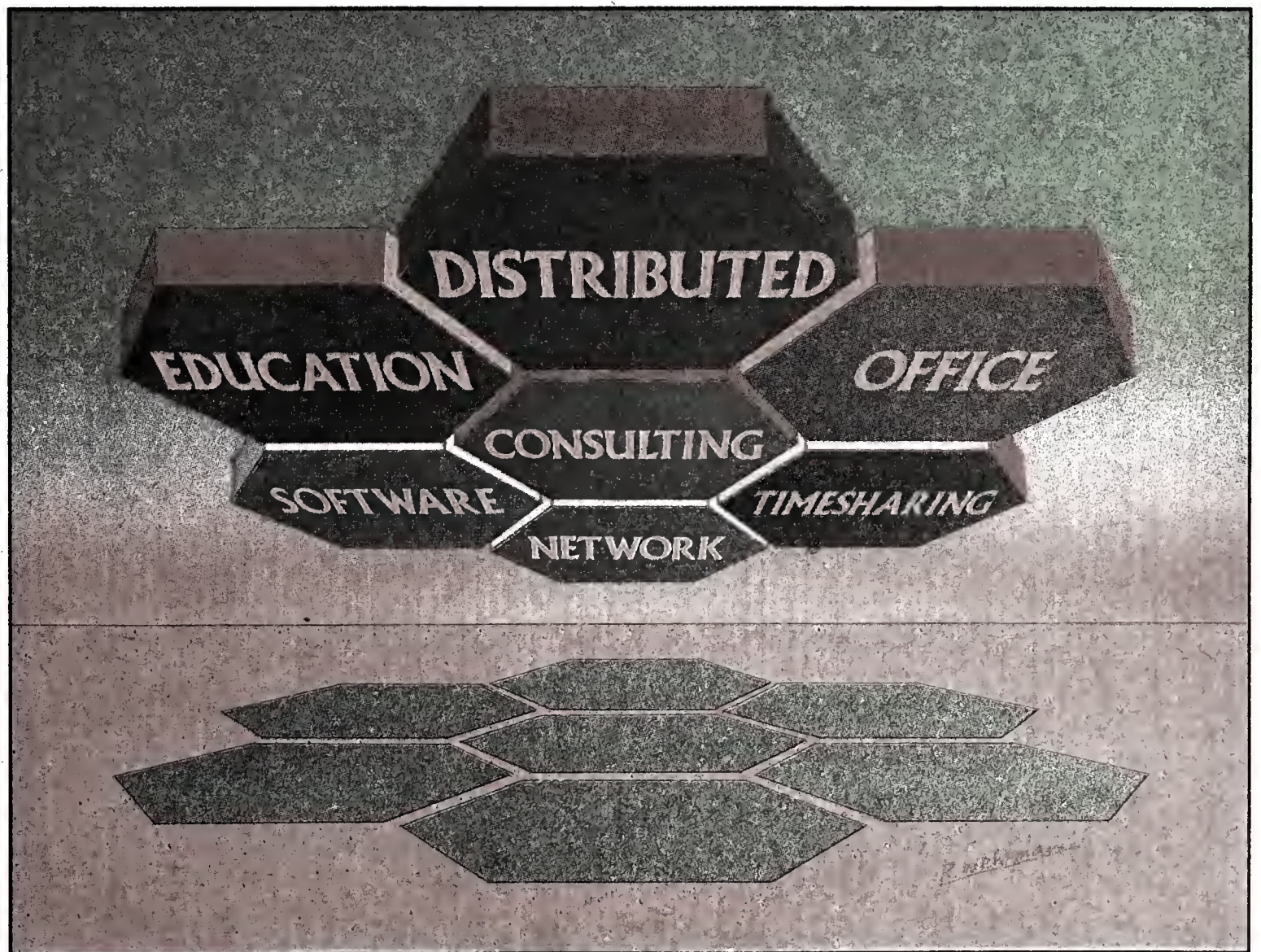
improve quality at the same time. They invested heavily in new plants and procedures, installing computer-aided design and manufacturing systems to improve speed and quality.

Case systems

Similarly, if information systems managers are to speed development and improve software quality simultaneously, they will have to invest in Case systems for their analysts, programmers and users.

One of the common complaints about SDMs has been that they create too much paperwork, and since that paperwork includes graphics as well as text, it is laborious to create and maintain. Case systems overcome this problem. They provide the user with graphics workstations linked to design data dictionaries and host computers for compilation,

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The case system

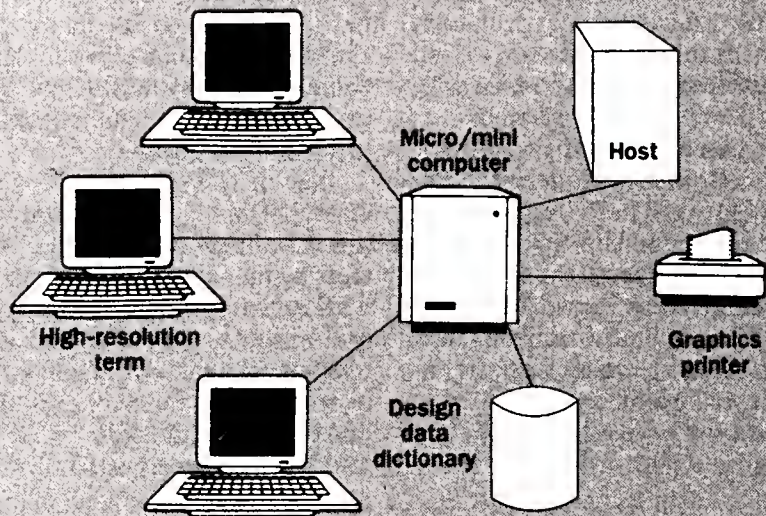


Figure 3

testing and interface with corporate data dictionaries.

In our own organization, we have been using the Nastec Corp. Design-aid system for nearly three years, and all of our internal documentation is currently on the computer. Changes can be made quickly to our systems design documentation at a very low cost, and camera-ready copies can be produced at any time.

Key to the fourth generation

In our experience, one characteristic distinguishes highly productive information systems organizations from those that are not as productive — discipline. Without exception, those organizations that do the best job of delivering high-quality software on time and under budget are the ones that have a systematic approach to all development and maintenance. They apply that discipline whether they are doing a 100-man-year project or a one-man-month one.

A second characteristic of more productive organizations is their commitment to planning. They plan for the future. Rather than viewing a

new tool or technique, such as a fourth-generation language, as if it were going to answer all their problems, they research the new product and then integrate it within the basic framework of their disciplined approach.

A third characteristic of these organizations is that they are data-oriented. The data base design philosophy that underlies the application systems of the organization is clearly the key to the fourth generation.

In the next 10 years, we are going to be redoing many of the large backbone systems in our organizations. To prepare for this undertaking, we need to make sure that our data bases are organized around a business communications model that will facilitate business rules and relationships now and in the future.

New technologies typically evolve through three stages: proceduralization, mechanization and automation. If we are to improve systems development speed and quality, we will have to adopt an engineering — in other words, disciplined — approach to building systems. We will have to invest in implementing a good fourth-generation structured SDM, and automating it with Case tools.

Integrating past and future

There is no such thing as a free lunch — remember the saying, "If it sounds too good to be true, it probably is." Software tools and technology are getting better; undoubtedly, this trend will continue. But tools and techniques will never become a substitute for intelligent management. Indeed, the faster things change, the more important intelligent management becomes.

We have a saying at our company. What we want for ourselves and our clients is to be able to "float on the technology." When technology changes, we want to be able to incorporate those changes into our way of doing business. We want to avoid becoming anchored at one level in the technology.

At the same time, we recognize that one of the jobs of intelligent management is to preserve that part of the past that works. There are some lessons to be learned here from when the Japanese introduced the robot. They discovered that the organizations that made the best use of robots were those that had the best manual manufacturing systems.

We're finding that the same holds true in the information systems business — those organizations that make the best use of the fourth generation are the ones that have been doing the best job of information systems engineering all along.

About the author

Ken Orr, president of Ken Orr & Associates, Inc., is one of the principal developers of the data structured systems development methodology.

Orr has held various positions, including vice-president of Advanced Systems for Langston, Kitch and Associates, Inc.; director of information and communications for state government; vice-president of a management consulting firm and manager of software development for Service Bureau Corp.

He is the author of Structured Systems Development, Structured Requirements Definition and The One Minute Methodology.

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COMMUNICATIONS

DATA STREAM

SBS: Making its way back to the MCI nest

By John Dix
CW Staff

Satellite Business Systems (SBS), 16 years in the making, has come back to roost with MCI Communications Corp.

A little-remembered fact in the recent deal — where IBM sold SBS to MCI in exchange for 16% of MCI's stock — is that MCI was one of the three companies that founded SBS back in 1969.

The history of SBS is interesting. John D. Goeken, one of the original founders of Microwave Communications, Inc., said in an interview [CW, Oct. 29] that "MCI thought that satellites would be ideal for long-haul telecommunications services. To try to make MCI into a more uniform company, in 1969, we formed a company with [Communications Satellite Corp. (Comsat)] and Lockheed Corp. called CML."

Faced with legal battles against established communications giants like AT&T — the monolith feared the gnat and, in retrospect, rightly so — MCI sold CML to

IBM and Comsat General in July 1974.

Under the terms of that deal, Comsat General was to up its stake in the company to 45%, and IBM was to obtain a 55% share for \$3.2 million. It was not to happen. Bowing before the hue and cry raised by competitors, the Federal Communications Commission blocked the acquisition in February 1975. In that ruling, the FCC established conditions under which the sale would be allowed.

Enter Aetna Casualty and Surety Co. On September 26, 1975, this subsidiary of Aetna Life and Casualty Co. joined the former partnership, diluting IBM and Comsat's interest in the company as required by the FCC. Three months later, the newly named Satellite Business Systems had submitted a system proposal to the FCC.

In January 1977, the FCC approved the SBS application. After a few court battles brought by competitors and an antitrust investigation conducted by the U.S. Department of Justice, SBS was

ready to fly.

Eight years later, the investment in SBS topped the \$1 billion mark, with most of that money coming from the original three investors. But the company had yet to earn a profit.

In 1984, SBS revenue was \$290 million, and losses were estimated at \$100 million.

The financial burden was getting too heavy, and last July, Comsat bowed out, selling 20% of its share to Aetna and the remaining 80% to IBM, giving the mainframe maker a controlling interest.

IBM replaced the SBS president with a Big Blue veteran, who didn't turn, and really couldn't have turned, the company around. The fundamental problem with SBS was that it was founded on the belief that demand for data communications, particularly high-speed data, was about to explode.

SBS believed that by 1980 it would have 126 earth stations installed, 375 by

See SBS page 68

■ Astrocom announced a seven-port statistical intelligent multiplexer that supports up to seven asynchronous terminals at speeds of 9.6K bit/sec./64

■ TCL introduced a repeater for use with Ethernet-type networks that enables cables to be interconnected/64

■ Analytics Communication Systems has announced Sherlock, a programmable encryptor/68

INSIDE

Multiplexers/
Modems/64

Local-Area
Networks/64

Auxiliary
Equipment/68

Equatorial unveils two-way satellite service

MOUNTAIN VIEW, Calif. — Equatorial Communications Co. has announced the addition of two-way satellite services to its one-way packet-switched satellite network product line.

Featuring a 4-ft transmitting and receiving micro earth station, the network service is designed for private corporate data networks with large central processing sites and hundreds or thousands of dispersed sites. Geared primarily to transaction response and data collection applications, the system supports terminal-to-host and terminal-to-terminal communications, the vendor reported.

Four application areas are being targeted by Equatorial — financial transactions, process monitoring and control, retail point-of-sale and branch office administration.

The company's C-200 transmit and re-

ceive micro earth stations have been tested since December 1984. Earlier this year, the company reached an agreement with Farmers Insurance Group of Los Angeles to sell an Equatorial interactive network to support data transactions from 3,000 agent and branch claim offices, a spokesman said.

Once equipped with an earth station, interactive network customers purchase the amount of network capacity required in each direction, reflecting the differences between transaction inquiries and the typical response. Capacity is available in increments of 9.6K bit/sec. Terminal reception of data sent over the network from the host computer may be continuous at up to 19.2K bit/sec.

Customer networks are operated from the company's Network Control Center here. The center provides redundant

transmitting and receiving electronics, an uninterruptible power source and continuous network monitoring and diagnostic analysis. Customer data is transmitted via Equatorial-owned and operated satellite transponders, 12 on Galaxy II and four on Westar IV.

In a typical packet-switched interactive network, users at remote locations use the C-200 micro earth stations to communicate through a geostationary satellite, which relays the message to a customer's central data base or to another micro earth station via an Equatorial master earth station. The 36-ft master earth station receives the response, packetizes the incoming data and transmits the signal to the designated receiving site.

The company's use of spread spectrum transmission technology permits the use of

See NET page 68

Telebit introduces asynchronous error correcting modem

Trailblazer offered in circuit card, stand-alone versions

CUPERTINO, Calif. — Telebit Corp. announced recently an asynchronous error correcting modem for use with dial-up lines that is said to provide an average throughput of 10K bit/sec.

The Trailblazer, targeted at Fortune 1,000 corporations, is available as a stand-alone device or as a circuit card for IBM Personal Computers and compatibles.

Trailblazer is based on a Motorola, Inc. 68000 microprocessor and uses a Texas Instruments, Inc. 320 signal processor, the company reported. It combines a proprietary modulation technique with two standard modulation methods as well as a patented technology to achieve the 10K bit/sec. throughput over voice-grade dial-up lines. The product is said to have adaptive duplex capability

that enables it to transmit in half or full duplex.

At high speeds, Trailblazer uses a Dynamically Adaptive Multiple Carrier Quadrature Amplitude Modulation, a proprietary technique the company developed. At lower speeds, which the modem falls back to in 100-bit increments as line quality degrades, the device uses Differential Phase Shift Key or Frequency Shift Key modulation.

Trailblazer also relies on a patented technology that divides the bandwidth of a voice-grade dial-up line into 512 communications carriers, according to Telebit President H. R. Johnson. Other modems typically use only one or two carrier signals, the president claimed.

The speed of transmission between Trailblazers is determined at the outset of a transmission as the modems test a telephone line and analyze the quality for each carrier in terms of the signal-to-noise ratio. Each of 512 carriers, which are actually 7.9Hz channels divided by frequency, is capable of carrying six bits when the line quality is good, the

company reported. Individual carriers may be of a lower quality and may be capable of supporting only two bits.

Incoming data, which is sent in the form of packets, is analyzed by a receiving modem to find out whether the transmission has been corrupted. If an error is detected — using a cyclical redundancy check character — the receiving modem rejects the contaminated packet and requests a retransmission.

After each packet is successfully sent, the modems reanalyze each channel and, if necessary, adjust the data rate to conform to any interim changes in its signal-to-noise ratio, Johnson said.

Because Trailblazer can match a channel's data rate to its current interference level, the product has access to a 50% wider bandwidth than conventional modems, the company reported. Trailblazer uses line bandwidth ranging from 300 Hz to 3,400 Hz, compared with a spread of 700 Hz to

See TELEBIT page 68

COMMUNICATIONS

MULTIPLEXERS/
MODEMS

■ **Racal-Milgo, Inc.** has announced the Omnimode 1614 modem with built-in diagnostic and test features that supports data speeds of up to 16.8K bit/sec. in point-to-point applications.

The 1614 has fall-back speeds of 14.4K bit/sec. and 12K bit/sec., the vendor said. It features a Remote Modem Control Option to allow modem speed, configuration and transmit level to be adjusted at remote sites with no operator present. The Omnimode 1614 also features an unattended testing capability for

fault isolation.

The Omnimode 1614 is priced at \$10,000 and is scheduled for fourth-quarter availability.

Racal-Milgo, 1601 N. Harrison Pkwy., Sunrise, Fla. 33323.

■ **Telebyte Corp.** has announced that the Accelerator Series 31 asynchronous data compression unit now supports Wang Laboratories, Inc.'s 2200 minicomputer System Flow Control functions.

The Accelerator can be installed between the Wang 2236 data terminal and a modem to triple data through-

put over existing modem links using the product's data compression algorithm, the vendor said. Used in conjunction with a 2,400 bit/sec. modem, Wang 2200 throughput is said to range from 7.2K bit/sec. to 9.6K bit/sec.

Channel rates supported range from 100 bit/sec. to 2,400 bit/sec. with the terminal set to operate at four times the channel rate. The Accelerator supports synchronous and asynchronous modems. Encoded bit strings are transmitted between Accelerators using a modified X.25 protocol to provide error checking and data security, the company reported.

Prices for the Accelerator Series 31 products range from \$995 to \$1,095 per unit.

Telebyte, 215 Oak St., Natick, Mass. 01760.

■ **Western Datacom Co.** has announced the 424 Error Free full-duplex, 2,400 bit/sec. rack-mount modem that automatically determines the best operating speed for the quality of a transmission line.

The 424 has fall-back rates of 1,200 bit/sec. and 300 bit/sec., the vendor said. The product is compatible with Bell Laboratories 212A and 103 modems at 1,200K bit/sec. and 300 bit/sec. and with CCITT V.22 modems at 2,400 bit/sec.

The 424 costs \$895.

Western Datacom, 5083 Market St., Youngstown, Ohio 44512.

■ **Astrocom Corp.** has announced the Astrocom Statistical Intelligent Multiplexer-7 (Asim-7), which supports up to seven asynchronous terminals on one line and transmits data at speeds of up to 9.6K bit/sec.

Features of the Asim-7 include a menu-driven screen that allows parameters to be set from a terminal keyboard, a spokesman said. In the event of a power failure, the Asim-7 operating parameters are stored in nonvolatile memory to prevent destruction.

A remote terminal setup capability allows the selection of parameters to be controlled from any customer-selected location.

The seven-port system is priced at \$1,395.

Astrocom, 120 W. Plato Blvd., St. Paul, Minn. 55107.

■ **Western Telematic, Inc.** has announced a four-user automatic-dial Bell Laboratories 212A-type modem, designated the Model MM-41.

According to a spokesman, each port in the MM-41 has a 20-number directory that lets the user automatically dial by name or number. Edit commands allow the addition

or deletion of names from the directory.

The unit also provides a password call-in feature for security.

The MM-41 modem is priced at \$795.

Western Telematic, 2435 Anne St., Santa Ana, Calif. 92704.

LOCAL-AREA
NETWORKS

■ **TCL, Inc.** has introduced a repeater for use with Ethernet-type IEEE 802.3 local networks that enables cable segments to be interconnected. The Model 2210 al-

lows networks to be extended to 2½ km.

The repeater is said to regenerate missing preamble bits, assuring all controllers time to synchronize, a spokesman said. Frame fragments are extended to 96 bits and are transmitted on both the transmitting and receiving side, thus minimizing collisions and retransmission, the spokesman added.

The TCL repeater is also said to enhance collision detection in both directions. After detecting a collision, the repeater transmits a 32-bit jam signal to both sides, then terminates the transmission to prevent a network lockup.

Continued on page 68

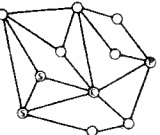
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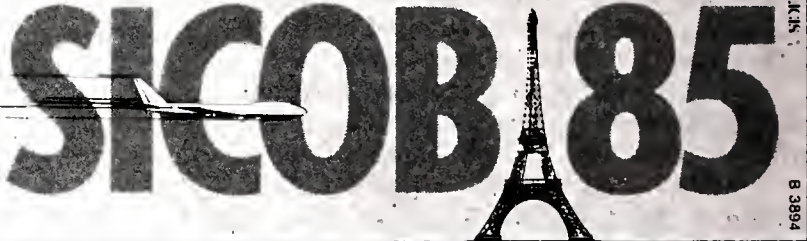
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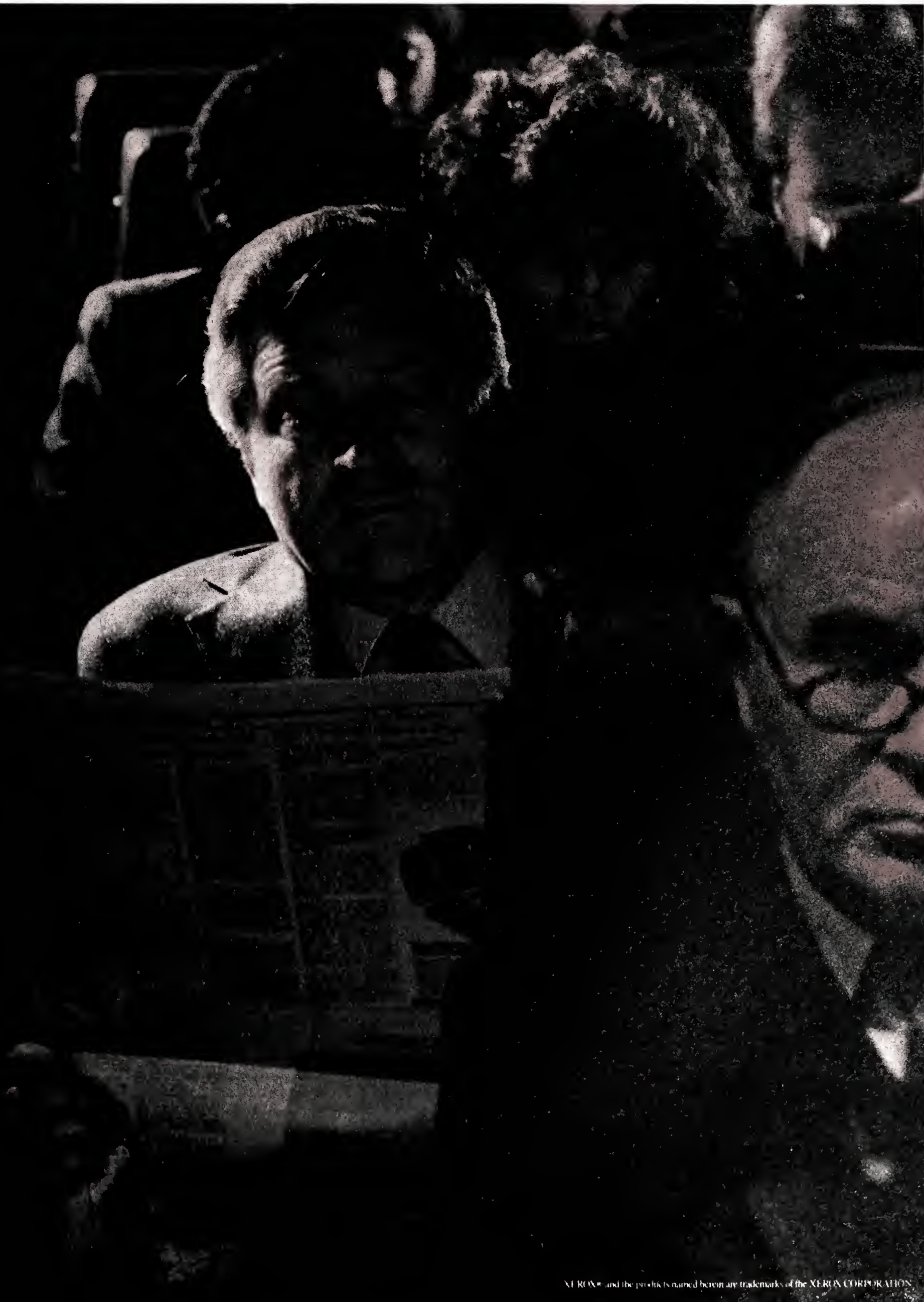
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Xerox Corp., Dept. 42013, P.O. Box 24, Rochester, NY 14292.



COMMUNICATIONS

Continued from page 64

A minimum of 96 bits will always be transmitted.

The repeater restores the original signal fidelity by removing timing, symmetry and amplitude distortions before transmitting the repeated signal.

The Model 2210 repeater is available in either 115V/60Hz or 230V/50Hz models and is priced at \$1,795.

TCL, 41829 Albrae St., Fremont, Calif. 94538.

AUXILIARY EQUIPMENT

■ Analytics Communication Systems has announced Sherlock, a programmable encryptor.

The product reportedly works for

end-to-end or link applications on dedicated or multiport circuits. Sherlock uses the Data Encryption Standard and meets U.S. government Standards 1026 and 1027 for link encryption applications, according to the vendor.

It works with half-duplex or full-duplex, asynchronous and synchronous transmission at rates from 50 to 9.6K bit/sec.

The encryptor features a 24-char. LCD. Physical security includes three pick-resistant locks to protect key entry and logic and locked-in cables. The product reportedly includes automatic testing as well as diagnostics.

Sherlock costs \$2,495, the vendor said.

Analytics Communication Systems, 1820 Michael Faraday Drive, Reston, Va. 22090.

■ Bytex Corp. has added packet switching and baseband interfaces to its line of electronic matrix switches.

An X.21 interface enables a user to patch, switch and monitor up to eight ports at speeds up to 38.4K bit/sec. for each card and a maximum line speed of 307.2K bit/sec.

The baseband card supplies full-duplex, synchronous and asynchronous transmission at speeds up to 19.2K bit/sec. It interfaces with digital service units and channel service units. Sixteen ports can be supported on the card, and the card's maximum transmission speed is 76.8K bit/sec.

The baseband port card is priced at \$2,640, and the X.21 port set costs \$1,750.

Bytex, Southboro Office Park, 120 Turnpike Road, Southboro, Mass. 01772.

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MARTIN MARIETTA

TELEBIT from page 63

2,800Hz for most competing products, Johnson said. The greater bandwidth, in turn, results in increased communications speeds.

Broadened bandwidth also enables the modem to transmit data even over low-quality phone lines and opens up applications that, until now, have remained technologically or financially impractical, the company reported.

Ten large corporations are said to be using Trailblazer already, all of which served as beta test sites for the product. They reportedly credited the modem with delivering an average throughput of 10K bit/sec.

In addition to being manufactured and sold directly by Telebit as Trailblazer, the modem will be marketed by Digital Communications Associates, Inc. under the name of Irma's Fastlink.

Trailblazer costs \$1,995 and is available for immediate shipment.

Telebit is headquartered at 10440 Bubb Road, Cupertino, Calif. 95014.

NET from page 63

small earth stations and C-band (4 GHz and 6 GHz) frequencies. The spread spectrum transmission is said to provide protection against interference from other satellites, from terrestrial microwaves and from signal degradation during rainstorms.

Company spokesmen estimated the savings over leased telephone lines to be approximately 25%. Costs are broken down as follows: \$5,800 for the earth station, \$900 for the installation, \$45 per month for maintenance, \$20 to \$100 per month for satellite services and \$35 per month for network management providing maintenance of the master earth station.

More information is available from Equatorial Communications, which is located at 30 Ferguson Drive, Mountain View, Calif. 94043.

SBS from page 63

1983 with two satellites in the air and 600 with three satellites and improved technology.

Today the company has achieved roughly what it expected to have achieved back in 1980. And much of the growth in revenues has come from carrying traffic other than high-speed data as was the company's original intent. For example, in 1983, of the 30 transponders on three SBS satellites, only six were being used for the company's Customer Network Services. Of the remaining capacity, 40% was used for cable TV, 10% for SBS' Skyline voice service and 30% was reserved for backup.

SBS based its predictions on detailed case studies involving 415 companies from the Fortune 500. These studies showed the risk the company was taking.

In fact, a company spokesman once admitted that the fate of the company might hinge on the creation and acceptance of new applications such as electronic mail, teleconferencing and direct channel-to-channel computer communications.

Maybe MCI can stem SBS losses by using the system to augment its voice network while waiting for these other applications to become reality.

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SYSTEMS & PERIPHERALS

Nixdorf hardware announced

WALTHAM, Mass. — Nixdorf Computer Corp. today unveiled a series of hardware additions to various systems in its product line.

Highlights of the hardware announcements include the following:

- An addition to the company's 8870 line of minicomputers called the Model 45. The unit features 256K to 1M bytes of main memory and can accommodate 24 workstations. It can run either Nixdorf's Interactive real-time operating system, Riros Release 5.1, or the company's Terminal Automatic Monitoring Operator System, Tamos.

A basic configuration, consisting of a CPU, 256K bytes of main memory, one 8-in. Fujitsu Ltd. fixed media disk drive capable of storing 66M bytes of data, streaming tape drive, one workstation, an internal modem and emergency power supply, costs \$33,400. Volume deliveries will begin in the first quarter of 1986, the vendor said.

- Nixdorf's first IBM-compatible microcomputer, called the 8810/25 Compact Personal Computer (CPC), which, like the firm's System Professional Computer 8810 Model 65 micro, reportedly can be attached to Nixdorf host processors as a native terminal.

The 8810/25 reportedly comes with a 9-in. monitor, detachable IBM Personal Computer-style keyboard, thermal graphics printer, a choice of one or two dual-density disk drives and a 10M-byte hard disk drive.

Other features include 256K bytes of random-access memory (RAM), which is expandable to 640K bytes, an Intel Corp. 8088 microprocessor and support for Microsoft Corp.'s MS-DOS Release 2.11 operating system.

A basic system, consisting of 256K bytes of RAM, dual floppy disk drives, monitor, graphics capabilities, thermal graphics printer, serial port, parallel port, red-green-blue port, operating system, Microsoft's GW Basic programming language and Digital Research, Inc.'s Graphics Environment Manager software, costs \$2,500, according to vendor.

The cost of systems that include a 10M-byte hard disk drive begins at \$3,900, the company said. The microcomputers will be available in September.

- A low-end addition to the company's distributed processing systems called the 8850/Micro 5. The unit features the same data capture and distributed functions as the 8850 processor and can function as a stand-alone processor or in a corporate network. The 8850/Micro 5 can access centralized 8850 or host data bases.

The system operates under Nixdorf's Distributed Processing Executive operating system and includes a CPU, peripheral control unit, 5¼-in. fixed disk drive, 5¼-in. diskette drive and a workstation. It comes with 128K bytes of main memory and is software compatible with other members of the 8850 product line.

The 8850/Micro 5 costs \$10,000 for a basic configuration and will be available in October.

The company is located at 300 Third Ave., Waltham, Mass. 02154.

Pyramid's 98X debuts

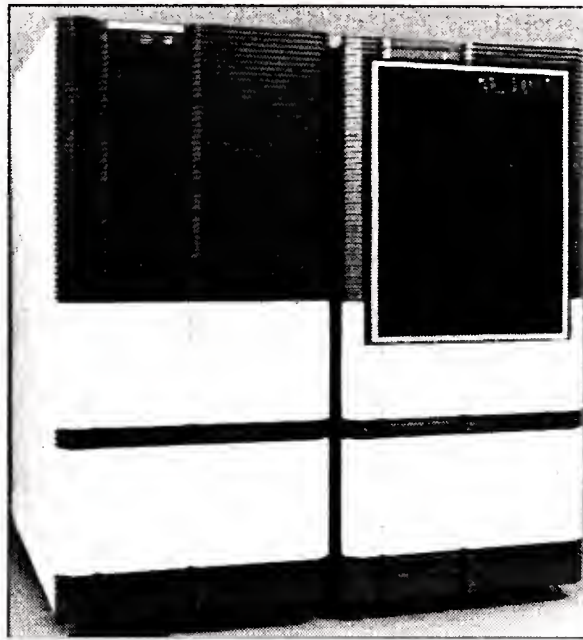
Unix-based twin-CPU unit beefs up high end

CHICAGO — Pyramid Technology Corp. last week unveiled a high-end addition to its 90X line of reduced instruction set computer (Risc) processors.

Called the 98X Isoprocessor, the unit consists of two symmetric CPUs, which are said to function equally, as opposed to a master/slave type of operation. The company said the 98X system architecture allows both the kernel and user code designed for the company's AT&T Unix operating system, called OSX, to execute on either CPU.

Capable of supporting up to 256 users and up to 32M bytes of main memory, the 98X has a maximum disk capacity of 5G bytes. The two-CPU configuration, the company said, consists of two equal Risc CPUs, which offer approximately 1.75 times the performance of the company's uniprocessor configuration. A spokesman said current users of the 90X uniprocessor can upgrade to the 98X configuration for roughly \$90,000.

The 98X CPUs employ Schottky transistor-to-transistor logic chips and feature a



Pyramid 98X superminicomputer

CPU cycle time of 100 nsec. Each Isoprocessor consists of an instruction unit, an execution unit, 32K bytes of cache memory and a microcode sequencer. The instruction units prefetch instructions from a 4K-byte instruction cache and operands from register stacked or immediate fields. The execution units perform as

See 98X page 76

PE 3200s get array processor

OCEANPORT, N.J. — Perkin-Elmer Corp. has announced that users of its Series 3200 superminicomputers can now attach up to three array processors manufactured by Floating Point Systems, Inc. (FPS) to their systems. The addition of the array processors is said to expedite large-scale arithmetic computations.

FPS-5000 series array processors can be added to the PE systems, a Floating Point spokesman said. Each processor is said to add up to 18 million floating-point operation/sec. of internal performance, according to a Floating Point spokesman said.

Prices range from \$45,000 to \$100,000, depending on the number of processors that are added.

Using FPS-supplied library routines or user-developed applications programs, the FPS-5000 processors are said to solve si-

multaneous equations; to multiply, normalize and invert matrices; to perform single-dimensional and multidimensional Fourier Transforms, digital filtering and convolutions; and to generate tabular functions.

FPS software includes processor

FPS's Standard Math Library software comes with the added processor. Optional applications software includes the FPS Standard and Advanced Libraries, FPS Simulation Library, FPS Signal Processing Library, FPS Geophysical Processing Library and FPS Image Processing Library.

These packages range in price from \$975 to \$1,275.

More information is available from PE, Data Systems Group, Two Crescent Place, Oceanport, N.J. 07757.

Lee Data unwraps Series 610 processor

MINNEAPOLIS — Lee Data Corp. has launched a number of products, including a multiuser associate processor, a color graphics display terminal for large-scale IBM computer users and two graphics systems printers for use with Lee's Series 300 and 400 controllers.

The multiuser Series 610 Associate Processor is said to form an extension of a company's IBM 3270 network and to offer productivity tools for individual departments by allowing 3270 users to share personal computer-like functions.

The unit allows users to create a shared relational data base and to use common word processing and spreadsheet applications by adding processing at the controller level. The 3270 terminal is connected to a Lee Data 400 controller through an RS-232 interface. This allows the terminal to access the mainframe or the associate processor, which is an Intel Corp. 80286-based processor.

The Model 614 in minimum configuration includes

1M byte of main memory, 40M bytes of hard-disk storage and Microsoft, Inc.'s Xenix operating system. The Model 614 in an average configuration costs \$18,990 and includes 1M byte of random-access memory, 70M-byte hard disk storage, a streaming tape drive, the Relational Data Base Systems, Inc. Informix data base applications software and the Xenix operating system. The units will be available in September.

Lee Data also announced a color graphics display terminal for IBM mainframe environments, which also has asynchronous capabilities to connect to other vendor's systems, including systems from Digital Equipment Corp. The terminal has a four-session windowing capability. The Model 2131 Open Window display system provides concurrent access to one or two large-scale mainframes. Using the four windows allows simultaneous display of information from separate host applications or data bases, allowing data to be copied from one window to another. Each window is

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- The pros of Cybernex and Microstar leasing/71

- Cybernex and Microstar unveiled a protocol syntax decoder/71

- Also for VME users, Dual Systems announced six modules for system design applications/71

- Xylogics unwrapped disk and tape controllers for VME bus systems/72

- A printer for IBM System/34, 36 and 38 users was introduced by Output Technology/72

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SYSTEMS & PERIPHERALS

Leasing offers added cash flow, flexibility, tax breaks

By Kenneth B. Steinback
Special to CW+

Computer leasing can be a good business strategy, especially for companies with large data processing equipment needs. Yet, many of the same firms that could benefit the most by leasing their computer equipment are unfamiliar with the advantages of third-party leasing.

Probably the most important factor in leasing is that there is no capital outlay. This often allows business managers to make more profitable use of their cash resources and keeps bank lines of credit intact for the expansions that can't be financed with a lease.

There can also be tax advantages to leasing. For example, lease payments are usually treated as deductible business expenses. For most companies, this means the actual cost of the lease is only half the cost of the payments.

Also, with leasing, system users have less of a chance of getting stuck with outdated computer equipment, which might be worth as little as 10 cents on the dollar.

Such a situation is possible in companies that quickly outgrow computer equipment. The cost of reselling computer equipment can be enormous, especially for users who do not have extensive knowledge of worldwide secondary markets.

Flexibility is another potential user benefit to leasing. Lessors can often get the equipment users need on a timely basis. Third-party leasing companies, for example, often specialize in locating equipment needed by users.

Lease plans can be structured to fit a company's needs, and lease payments can sometimes be arranged to meet a company's particular cash flow needs. For example, some customers need the unique flexibility of

fered by short-term leases, which run anywhere from six to 36 months.

Third-party leasing companies can give users the flexibility to incorporate mixed vendor's systems. For obvious reasons, most OEM leasing programs do not promote this kind of strategy.

Any data processing executive knows the headache of equipment delivery and set-up. Leasing companies can offer flexible delivery schedules because of their hardware inventories and purchasing networks. Often, early order positions of hard-to-find hardware are available from third parties. Also, if users have existing delivery problems, leasing companies can sometimes help.

Steinback is president of Computer Sales International, Inc., and a director and treasurer of the Computer Dealers and Lessors Association, an industry trade organization.

TURNKEY SYSTEMS

■ Cybernex Ltd. and Microstar have launched a North American Presentation Level Protocol Syntax (NAPLPS) decoder said to be standard reference model compatible.

The NCG1024 decoder allows the user to display information from NAPLPS data bases on a color monitor. The color monitor is not included in the system. An RS-232 interface allows access to the host computer on which the NAPLPS data is available.

The system, which consists of a graphics controller and a CPU module that is VME-card based, a keyboard, switching power supply and Naplps software in a metal desktop enclosure, costs \$4,995.

Cybernex, P.O. Box 9086, 1257 Algoma Road, Ottawa, Ont. K1G 3T8

PROCESSORS

■ Dual Systems Corp. has released six VMEbus modules said to be targeted to 32-bit computer system design work.

The VMPU-32 VMEbus CPU module has a 16-MHz Motorola, Inc. 68020 CPU, a 1M-byte, dual-port random-access memory (RAM) with 32-bit data path and parity error detection, paged memory management, optional floating-point coprocessor, real-time clock with lithium battery backup and up to 32K bytes of on-board erasable programmable read-only memory (Eprom). The board was designed to run AT&T's Unix operating system. It costs \$5,250 and will be available in the fourth quarter of 1985.

The Vmem VMEbus module offers RAM storage of 2M bytes based on 256K-byte dynamic RAM chips. The Vmem is said to be able to prefetch and cache the next sequential longword. The prefetch cache allows an 85-nsec access time on sequential reads, 290-nsec access time on random cycles and 240-nsec access time on writes. The unit supports 32-, 16- and 8-bit data transfers. The Vmem units cost \$3,995.

Also available is a V9TRK VMEbus module for control of a 9-track tape drive in multiuser computing systems, which operates in IBM Ansi standard format. The V9TRK is a four-layer dual-height printed-circuit board built to Revision B of the VMEbus standard. The V9TRK is

Continued on page 72

How is Duquesne Systems teaching Fortune 500 companies to share?



Duquesne Systems' Shared Device Management products are helping many Fortune 500 companies with multiple CPUs to share resources. STAM, SDSI^{PLUS} and SCON improve performance and eliminate data integrity exposures in MVS and MVS/XA installations.

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SYSTEMS & PERIPHERALS

Continued from page 71
priced at \$1,250.

The company's System Controller Module (SCM) is a VMEbus system controller module that connects to the back of slot one on the backplane via the P1 connector. The SCM is said to operate in conjunction with the CPU, memory, I/O, disk controller and other VMEbus modules in Dual's family, but it is not restricted to Dual modules. It is compatible with Revision B of the standard VMEbus specification. The SCM board costs \$495.

The Viop I/O processor module can serve as a stand-alone CPU with the functions and features of the Motorola 68000 16- and 32-bit microprocessor. It can also marry a variety of I/O channel-compatible modules to VMEbus systems. It is said to function with either Dual's IO-S8 card or with modules from other manufacturers.

Features include 512K bytes of dual-port dynamic memory with parity error detection, up to 64K bytes of Eprom, 10-MHz operation, and it costs \$1,495. The IO-S8 costs \$495.

The Optimatrak-32 Storage Module Device (SMD) Disk Controller is said to control up to three Winchester disk drives, which employ the SMD interface. In conjunction with a disk transfer algorithm, a full track can be read or written in slightly more than one rotation of a disk, the vendor said. The controller gives a sustained data rate of approximately 1.5M byte/sec. for reads and 1.1M byte/sec. for writes measured using a 2,048-byte block size with Fujitsu Ltd. 2333 disk drives. The unit costs \$2,990 and will be available in the third quarter of 1985.

Dual Systems, 2530 San Pablo Ave., Berkeley, Calif. 94702.

DATA STORAGE

■ Xylogics, Inc. has introduced two 32-bit bus products, the 751 VMEbus storage module drive (SMD) disk controller and the 772 VMEbus ½-in. tape controller that support VME 32-bit address and data.

The 751 disk controller supports SMD interface drives up to and including the 2.4M byte/sec. Fujitsu America, Inc. Higher Storage Module Device. It has a direct memory access of 10M byte/sec., achieved via a pipeline architecture and two additional custom very large-scale integration circuits developed by Xylogics. Eight-, 16- or 32-bit modes can be selected in software.

A programmable throttle that controls the length of time the 751 remains on the VMEbus is another soft-

ware-selectable option. The unit features a separate 2K-byte command buffer and an 8K-byte FIFO buffer. The unit costs from \$1,600 to \$2,700, depending on discounts.

The 772 controls any ½-in. tape with Pertec Computer Corp. formatted tape interfaces. It supports a variety of reel-to-reel streaming and ½-in. cartridge tape drives from 12.5 in./sec. phase-encoded models up through 200 in./sec. group-coded recording drives.

The 772 costs from \$1,100 to \$1,800, depending upon discounts.

Xylogics, 144 Middlesex Tnpk., Burlington, Mass. 01803.

TERMINALS

■ Daisy Systems Corp. has introduced a workstation that is said to integrate Daisy's Personal Logician Dnix computer-aided engineering workstation with Intel Corp.'s Integrated Instrumentation and In-Circuit Emulator (I²ICE) workstation to design, develop and debug both hardware and software for microprocessor-based systems.

The Personal Logician-Microprocessor Design Station (PL-MD) uses Daisy's Dnix operating system, which is said to be the company's implementation of AT&T's Unix. I²ICE is said to allow software developed on the PL-MD station to be debugged on target hardware. The PL-MD also supports a set of Daisy microprocessor software development tools.

The basic PL-MD system includes the Personal Logician Dnix workstation with 1.75M bytes of memory and the I²ICE unit with 32K bytes of main memory for \$37,000.

The probes range in price from \$3,000 to \$5,000. Up to two memory boards of 128K bytes can be added for \$4,400 apiece. Language compilers for C, Fortran, Pascal and PL/M can be added for \$1,000 to \$2,000 each, the vendor said.

Daisy Systems, 700 Middlefield Road, Mountain View, Calif. 94043.

PRINTERS/PLOTTERS

■ Output Technology Corp. has released its OT-777 printer, an addition to the company's 700 series.

The OT-777 is a serial dot matrix printer that is said to print at 700 char./sec. It comes with parallel and RS-232 serial ports and an internal protocol device that allows direct interaction with IBM System/34, 36 and 38 computers. The unit features dual pass correspondence-quality printing at 350 char./sec., dot-addressable graphics capabilities and front-panel menu programming.

The printer costs \$2,995 until Oct. 1, when the price becomes \$3,195.

Output Technology, E. 9922 Montgomery Bay 33, Spokane, Wash. 99206.

■ Integraph Corp. has announced a photogrammetric engineering stereo plotter workstation that can be used for standard aerial photogrammetry projects and applications such as close-range industrial and terrestrial photogrammetry.

The Intermap Analytic, up to four of which can be connected to Integraph's Micro II data processing sys-

Continued on page 76

Realia COBOL. Migration without migraines.

Until recently, you had to abandon the business computer language when you developed micro-computer application software. The available micro COBOLs were inadequate—too limited, too slow. The best alternative—the XT/370 or AT/370 using IBM's COBOL—was very expensive and still too slow. To get acceptable performance, you had to retrain your programmers in Pascal or C.

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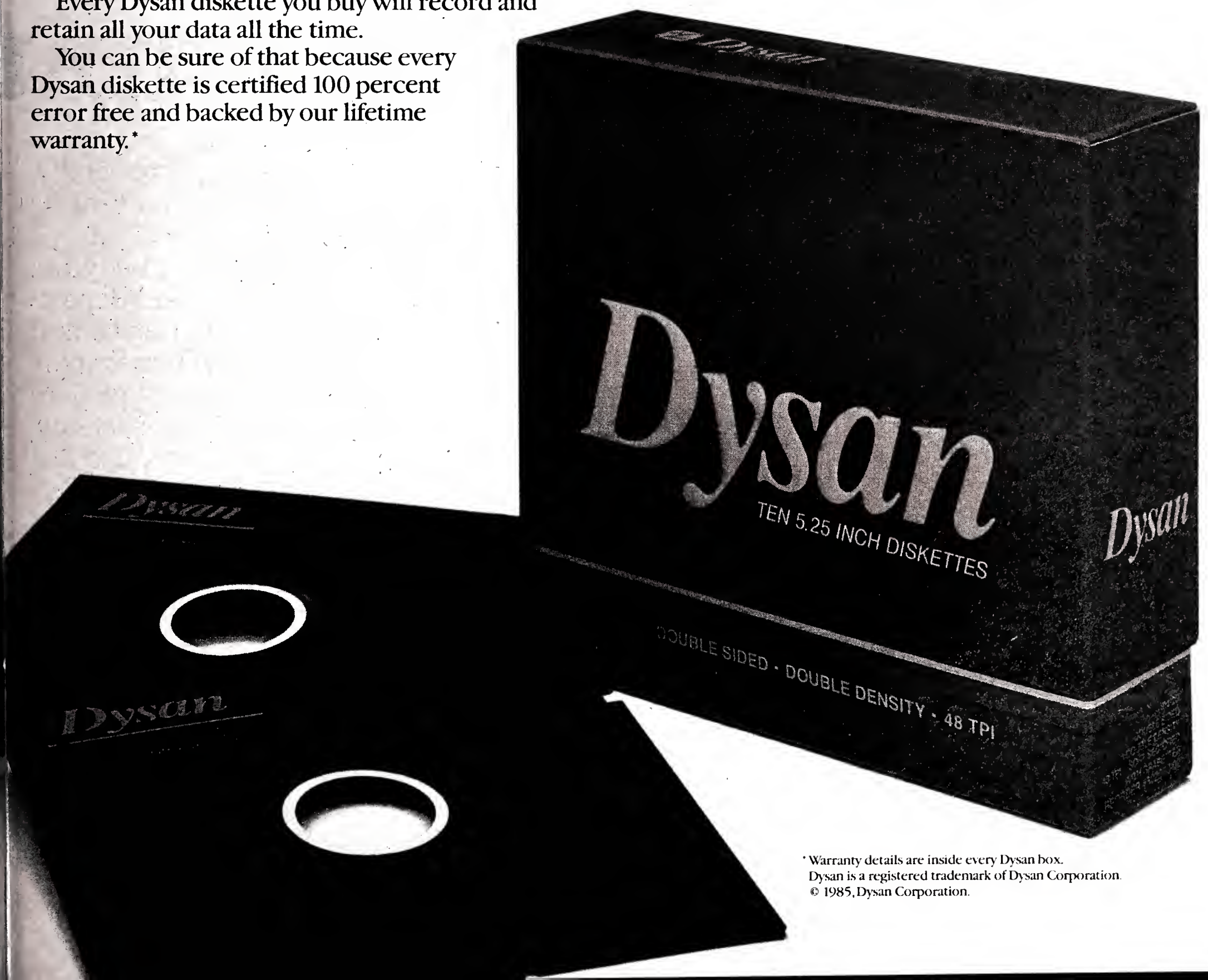
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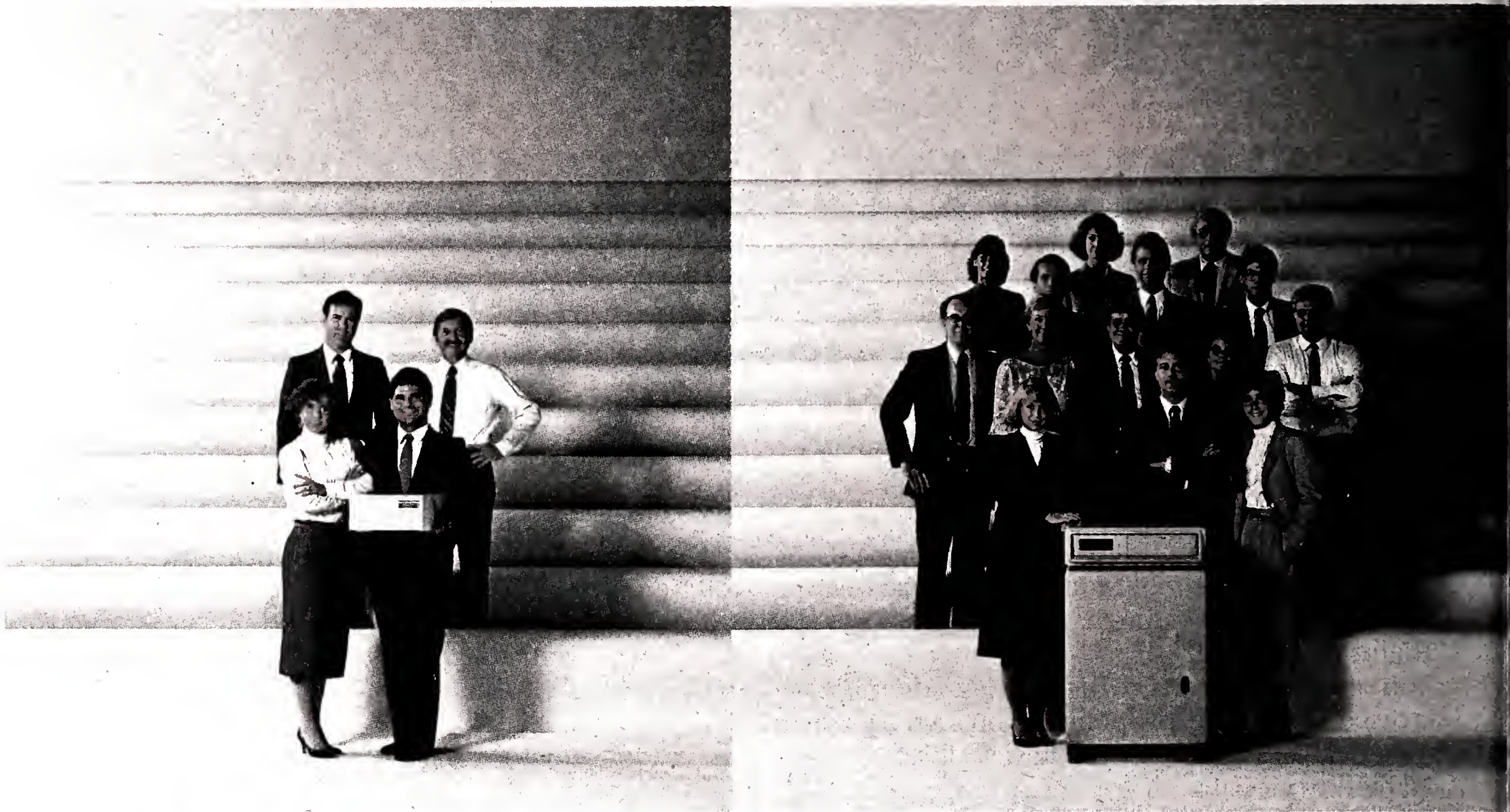
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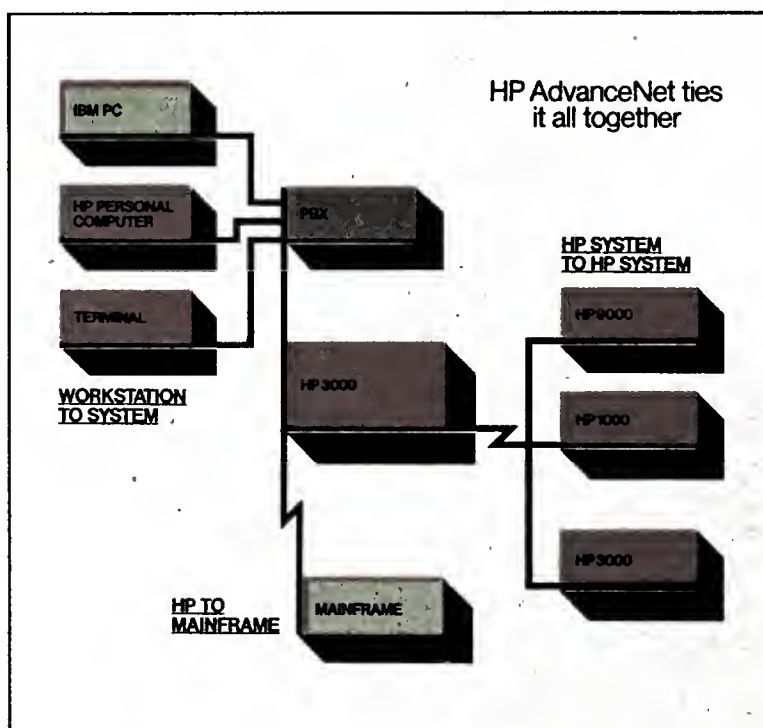
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SYSTEMS & PERIPHERALS

Continued from page 72

tem, has a 15-in. super imposition monitor and a 19-in. color graphics terminal and reference display. This display carries the same view as the super imposition monitor when photogrammetry is in process.

The system includes a calibration software package, the Integrgraph Aerial Triangulation package, and orientation software. It costs approximately \$175,000.

Integrgraph, One Madison

Industrial Park, Huntsville, Ala. 35807.

POWER SUPPLIES

■ **Topaz, Inc.** has announced a line of Peak-Current Line 2 power conditioners for protecting micros from malfunctions caused by ac power disturbances.

Voltage is said to be corrected to within -8% and

+4% of normal-rated voltage for input variations of 90 Vac to 138 Vac.

Prices range from \$410 to \$1,590.

Topaz, 9150 Topaz Way, San Diego, Calif. 92123.

■ **International Power Machines** has released power distribution units that are said to distribute electrical power to mainframe computers and their peripherals and eliminate the need for

permanent wiring.

The power distribution unit is placed on the computer room raised floor, with cables, junction boxes and connections located beneath the floor. When equipment is relocated or when the power distribution unit is moved, the cables are adjusted to the new configuration.

Prices range from \$7,000 to \$23,000.

International Power Machines, 11534 Pagemill Road, Dallas, Texas 75243.

LEE from page 69

said to be able to use up to eight colors.

When used in the asynchronous mode through a Lee Data 400 controller, the Model 2131 can emulate the Digital Equipment Corp. VT52, VT100 and VT132 terminals and can access up to 32 different asynchronous hosts. The Model 2131 color terminal with windowing capability costs \$2,866 and with windowing and graphics capabilities costs \$2,995.

Two graphics system printers — the Model 1361 Universal Printer and the Model 1362 Universal Color Printer — were designed for use with Lee Data series 300 and 400 (4.1 level) controllers and offer print rates of 400 char./sec. in draft quality and 100 char./sec. in letter quality, the vendor said.

The Model 1361 will cost \$5,995, and the Model 1362 will cost \$7,190 when they become available in September 1985.

More information can be obtained from Lee Data, located at 7075 Flying Cloud Drive, Minneapolis, Minn. 55344.

98X from page 69

defined by the microcode sequencer. The company claims the system includes a pipelining feature that overlaps instruction unit and execution unit operations.

Each CPU contains 528 32-bit registers that are implemented in a stack configuration consisting of 16 levels of 32 registers each. There are also 16 global registers, the company said.

An I/O subsystem, consisting of an I/O processor, disk controller and up to four disk drives, supports a data transfer rate of up to 3M byte/sec. The 90X was designed to operate with the company's 32M byte/sec. message-based I/O bus called Xtend.

The Isoprocessor OSX operating system uses a proprietary semaphore mechanism to protect critical code sequences and control simultaneous access to kernel data structures.

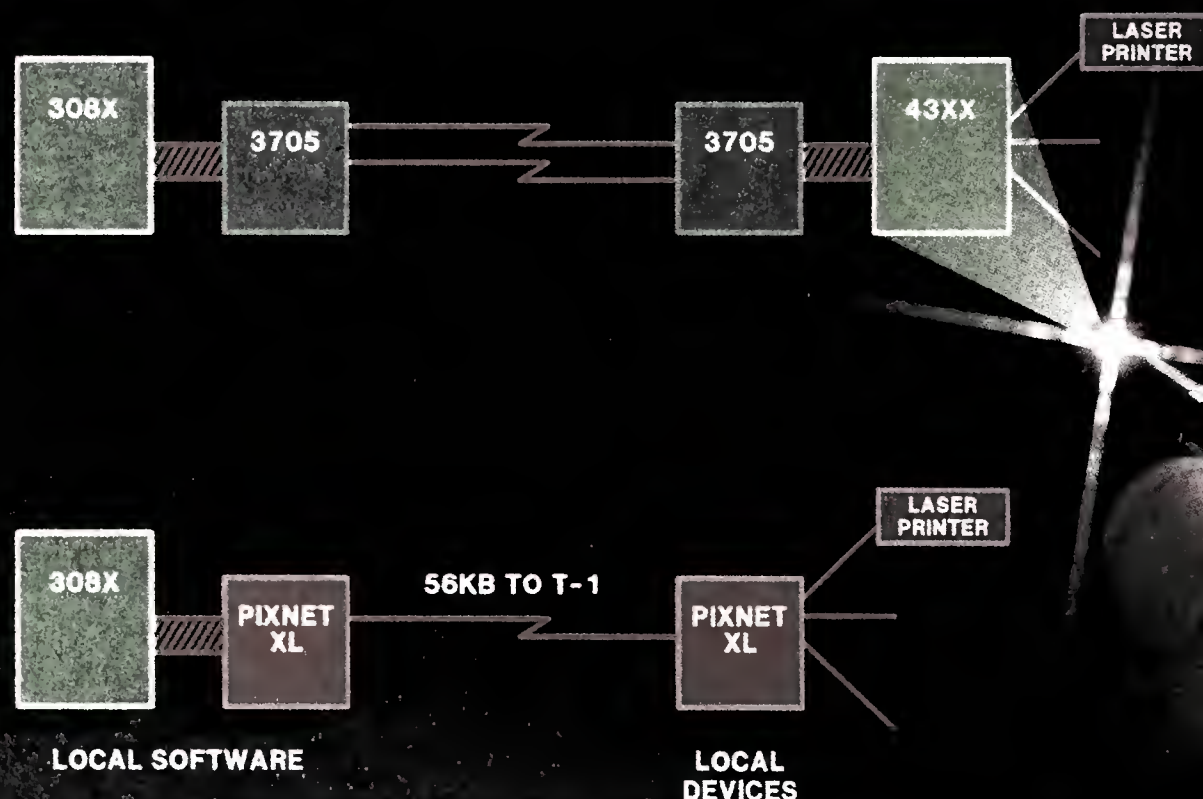
This semaphore mechanism, the company said, was designed to allow the two CPUs in the 98X processor configuration to operate without major structural changes to the Unix kernel.

Available in October, the 98X Isoprocessor configuration costs from \$260,000 to \$500,000.

A typical configuration consisting of 8M bytes of main memory, two 470M-byte disk drives, a 6,250 bit/in. magnetic tape drive, 32 RS-232 ports, a color console and a 32-user license of OSX costs \$307,000.

The vendor is located at 1295 Charleston Road, Mountain View, Calif. 94043.

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COMPUTER INDUSTRY

U.S. to probe SLA charge of Japanese trade barrier

By Clinton Wilder
CW Staff

SAN JOSE, Calif. — Responding to a recent trade complaint by the Semiconductor Industry Association (SIA), the U.S. government will investigate allegations of Japanese government and industry trade barriers to imports of U.S.-made semiconductors.

U.S. Trade Representative Clayton Yeutter announced July 11 that he will investigate the SIA's allegations and initiate talks with Japanese officials to discuss increasing Japanese market opportunities for U.S. chip makers.

Yeutter, who was recently named to his new position, is expected to submit a report to President Reagan by June 1986.

SIA President Thomas Hinkelman hailed the decision, saying, "Yeutter's decision to initiate this case as one of his first actions is a welcome demonstration of the priority the U.S. government is

giving this issue."

Although some U.S. chip makers have urged limits on Japanese imports of chips into the U.S. [CW, June 17], the SIA's official position has been to lobby for actions that would increase the U.S. vendors' share of the Japanese market. Japanese sales accounted for 17.4% of the U.S. market in 1984, and U.S. sales accounted for just 11.4% of the Japanese market, according to Dataquest, Inc., a market research firm based here.

The discrepancy in certain specialized products was much greater. For example, Japanese vendors sold 67.9% of the 64K-byte erasable programmable read-only memory (Eprom) chips sold in the U.S. in 1984, while U.S. manufacturers sold no 64K-byte Eprom chips at all in Japan, according to Dataquest.

In a related development, the U.S. chip industry's woes showed little sign of abating.

See **CHIPS** page 98

Bank explores high-tech Europe trade

By Peter Bartolik
CW Staff

BOSTON — In this port city, from which Yankee clippers once sailed forth to wrench a dominant position in world commerce, a leading bank hopes to capitalize on Europe's seemingly insatiable demand for U.S. technology.

State Street Trade Development Co., Inc. (TDC) was formed in 1983 to exploit the export possibilities opened up by a 1982 law. TDC was specifically chartered by its parent company, State Street Boston Corp., to explore high-technology trade opportunities. State Street Boston is the holding company for the \$4.5 billion State Street Bank and Trust Co.

"In 1982, when [U.S. Congress] passed the Export Trade Act, the intent was to reinvolve banks in the export process for the first time in 50 years," said Lawrence Meyers Jr., a managing director of TDC. That involvement can include actually taking title to goods and then shipping them overseas for resale, "much like the old Yankee traders," he added.

Alfred S. Woodworth Jr., another managing director, observed, "There just isn't the trading company tradition in the U.S. like there is in Japan." Although there are several established companies, they tend to be small scale and "not generally in the large trading company tradition that exists in other countries," Woodworth said.

The company, which in late 1984 was the first bank-affiliated trading firm to be granted an export distribution license by the U.S. Department of Commerce, has structured a variety of services to promote exports of smaller high-tech firms that cannot afford to create overseas distribution channels independently in the manner of IBM and Digital Equipment Corp.

It operates in three areas: planning and managing international distribution channels; administering master distribution contracts to move large quantities of

■ To gain ground on IBM, micro and mini vendors are now targeting vertical markets/**78**

■ Small companies are seen weathering industry shake-up, not shakeout/**80**

■ Kaypro reports a third-quarter loss of \$6.2 million/**82**

Pitfalls of microcode romance



INDUSTRY INSIGHT

Peter Bartolik
CW Senior Editor

Syncsort, Inc. President Aso Tavitian recently declared a victory over IBM and microcode [CW, July 15].

In Tavitian's view, IBM's June announcement of Release 7.1 of DFSort, a product Syncsort competes against, retracted previous claims that microcoded instructions in mainframes running MVS/XA improved performance of Release 7 over Release 6.

IBM sniffed at Tavitian's claim and

responded that the initial February announcement of Release 7 had attributed performance improvements to use of additional virtual storage. That may be true, but it was certainly made much clearer with the June announcement that said, "Significant performance improvement... is realized through the automatic acquisition of additional virtual storage." The February announcement, after saying the microcode is used "to improve sort performance," a few paragraphs later noted the "capability to" access additional virtual storage.

Tavitian claimed that IBM's February announcement did not clearly tag performance improvements to additional storage, and statements made to users

See **CODE** page 99

Lee Data wins rights to Visual Technology's micro system line

MINNEAPOLIS — Lee Data Corp., which earlier this year was unable to reach a merger agreement with Visual Technology, Inc., announced recently it had acquired exclusive technology, manufacturing and marketing rights to Visual Technology's multiuser microcomputer system line.

Lee Data said the Visual 2000, an Intel Corp. 80286-based supermicrocomputer, will be marketed as the Lee Data System 2000.

Last year Lee Data had reached a preliminary agreement to acquire Tewksbury, Mass.-based Visual Technology in a \$16.8 million stock exchange [CW, Nov. 19]. Early this year, however, the deal was terminated [CW, Jan. 28].

In the recent announcement, Lee Data said the agreement with Visual

Technology is valued at \$3.1 million but that \$3 million has already been paid to Visual Technology under an agreement reached in March for the firm to deliver finished products on an OEM basis to Lee Data.

The agreement provides Lee Data with all rights to the System 2000 on an exclusive basis under a 15-year license agreement along with the transfer of certain Visual Technology assets. Lee Data said it has formed a Computer Systems Division to be based in Massachusetts for design and marketing of the System 2000 and has made individual employment offers to 25 current Visual Technology employees. Former Visual Technology employees Jeff Herrmann and Jay Gehrig joined Lee Data as vice-presidents of marketing and engineering.

See **WIN** page 99

Japan computer market

Company	Rank	Domestic Sales* (in millions of dollars)
Fujitsu Ltd.	1	2,787.6
NEC Corp.	2	2,276.4
IBM Japan Ltd.	3	2,182.0
Hitachi Ltd.	4	1,713.2
Toshiba Ltd.	5	768.8
Mitsubishi Electronics Corp.	6	528.0
Oki Electric Co.	7	510.0
Sperry Corp.	8	476.4
Burroughs Corp.	9	284.00
NCR Corp.	10	278.4

TOKYO — Sales of the top 10 computer manufacturers in Japan — including mainframe, minis and microcomputer makers — increased an average of 24% in 1984, according to *Computerworld Japan*. Japan slipped from second to third place in domestic sales, bumped out by NEC Corp. As a general rule, exports showed a larger growth than domestic sales and IBM Japan was the leading Japanese exporter, earning it the rank of second in overall sales, behind Fujitsu Ltd.

* Money conversion rates are based on 250 yen to the U.S. dollar

Source: *Computerworld Japan*

COMPUTER INDUSTRY

Vertical marts hold promise for micro, mini vendors

By Kathleen Burton
CW West Coast Bureau

MENLO PARK, Calif. — High-growth vertical markets will become targets of microcomputer and minicomputer vendors during the next five years as competitors overcrowd traditional horizontal markets, industry analysts say.

By 1989, U.S. computer manufacturers will ship \$14.5 billion worth of minicomputers, up approximately 40% from 1985 shipments, and \$8.2 billion worth of personal computer systems, up approximately 70% from 1985 shipments, to domestic vertical users, said Brian Jeffery, research director at International Technology Group, Inc. in Palo Alto, Calif.

According to Jeffery, companies like Digital Equipment Corp., Data General Corp. and Hewlett-Packard Co. now realize that their failure to establish a strong presence in mini and micro vertical markets has given IBM a two-year lead and substantial market share. "They're now trying desperately to decrease IBM's substantial lead in verticals," Jeffery said, adding that IBM now controls 20% of the mini and 40% of the personal computer vertical markets in the U.S.

Aaron Goldberg, a research analyst at International Data Corp. in San Jose, Calif., said 60% to 65% of multiuser computer systems installed in 1985 will directly target vertical markets. "Verticals are a way for vendors to sell systems and leverage their selling efforts in spite of increasing competition," he said.

Goldberg said vertical markets also enable vendors to establish valuable long-term relationships with value-added resellers, independent software vendors and OEM resellers. "[Value-added resellers] leverage selling efforts, add value to products and address wider markets by selling different solutions," he said. "Verticals will let companies en-

ter areas they've never been in before."

Mike Gardner, marketing manager of HP's Information Systems Group, which targets vertical markets with HP 3000 products, said vertical marketing strategies, including solution selling, specialization and market differentiation are what HP "needs to learn as a company."

According to Gardner, these concepts are being disseminated into traditionally nonvertical HP groups such as personal computing, medical in-

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Companies realize that their failure to establish a strong presence in mini and micro vertical markets has given IBM a two-year lead and substantial market share.

strumentation and applications productivity, each of which will establish vertically oriented sales districts sometime this year.

Gardner said vertical markets now represent 20% of HP's total commercial computing business, excluding personal computers and large accounts over \$100 million.

Maynard, Mass.-based DEC is increasingly focusing on high-growth office automation vertical markets to leverage its expertise in sales and distribution, said Robert Thaler, industry marketing manager for DEC's legal, retail and construction vertical markets.

According to Hal Feeney, a researcher at Data-

quest, Inc., a San Jose, Calif.-based market research firm, vertical markets currently represent almost 35% of DEC's overall business.

Although DEC has been involved in vertical marketing since the early 1970s, the company consolidated its vertical distribution channels under one vice-president last year, Thaler said. During 1985, DEC plans to expand several of its technically oriented vertical markets, including health care, to include business and collections, he said.

Sales representatives in DEC's vertical market and large-accounts divisions now often work together as strategic teams, Thaler added, and the relationship is "synergistic rather than competitive." For example, Thaler said, DEC's vertical legal skills are increasingly being used to help the company's direct sales staff sell to the legal departments of large corporations, with both groups often offering customers the same applications.

Robert Johnson, director of marketing support for the Information Systems Division of Westboro, Mass.-based DG, said the company is increasingly focusing on vertical markets because competition in other areas is getting stiffer, and corporate decision makers are looking for total solutions.

DG is now involved in 20 vertical markets, according to Johnson, including insurance, banking, brokerage firms, health care and telecommunications and is planning on increasing its commitment in these areas. Targeting these vertical markets, DG is heavily recruiting independent software vendors, who number approximately 95 company-wide, Johnson said.

DG also recently initiated a pilot vertical marketing sales program that is being tested in New York. Under this system, a single DG sales team concentrates its selling efforts on specific banks or brokerage firms in the New York area, offering these customers any DG product or service.



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Data News reaches 12,500 Brazilian DP professionals weekly. It covers new products and services, current applications and latest industry developments and trends.

MicroMundo is the only microcomputer publication in Brazil. Each month, 30,000 Brazilian micro and personal computer users read *MicroMundo*. The editorial keeps users up-to-date on all current news in the micro world.

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COMPUTER INDUSTRY

Small firms weather slump as giants remain vulnerable

By David C. Dykstra
Special to CW#

Sales and income results for the first quarter of 1985 for publicly stock-traded computer companies reflected slowing growth in computer sales and weaker earnings in the computer industry. Forecasts and preliminary reports for the second quarter indicate a continuing slump.

The surprise is that the industry is having a shake-up, not a shakeout, and many of the smaller companies are weathering the storm better than the giants that many experts view as the survivors of the impending shakeout.

The quarter's results reflect the smallest growth rate in sales and the largest percentage decline in earnings during the last five years.

Only 7% increase

First-quarter sales in 1985 increased only 7% over the corresponding prior year's quarter. This compares with an average annual growth rate of 22% over the past five years.

First-quarter net income declined 22% from the corresponding prior quarter to a 5.6% net profit margin. This, however, is not disastrous when compared with the recently published Fortune 500 net profit margin of 4.9% for 1984.

Although many tout IBM's strength and ability to dominate the market, its profit margin vulnerability and its pressure to maintain market share are also evident.

In the first quarters of 1984 and 1985, with 29% and 28%, respectively, of the industry's total sales, IBM had 48% and 50%, respectively, of the industry's profits. IBM's profit margin as a percent of sales is more than double the average of all other computer industry companies. When IBM quivers, the industry shakes.

IBM's quarterly sales increased only 2% to \$9.8 billion. Profits, however, declined 18% to \$216 million.

The second tier

The second market tier under analysis consists of 33 companies, each with sales less than IBM's sales but greater than \$150 million for the 1985 first quarter.

The sales of these companies grew 7.6%, which was

greater than IBM's sales increase of 1.9%. Profits suffered more severely as this group's net profits declined 29% to a 3.8% net profit margin.

The profit impact was most severe on the companies that have increased their efforts to compete head to head with IBM in its various markets. Some of

these companies are Texas Instruments, Inc., Control Data Corp., Tandy Corp. and Wang Laboratories, Inc.

Costs force profits down

Apple Computer, Inc. had a strong 45% sales increase from the Macintosh product line. But the costs associated with aggressively trying to penetrate increasingly com-

petitive markets caused its net profit margins to shrink to 2.3%.

Some of the companies that maintained their market direction in niches away from the mass competition had very good performances. Telex Computer Products, Inc., a manufacturer of specialty terminals, had a sales increase of 82% and main-

tained a 9% profit margin. Automatic Data Processing, Inc. had a 16% sales increase and improved its net profit margin from 9.4% to 9.6%.

The 233 smaller companies, with average sales for the quarter of \$26 million, had a greater sales growth rate and a less severe profit decline. Sales grew 14% while net income declined

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Dykstra is an independent data processing/office automation consultant, author and lecturer. He is president and owner of Dykstra Consultants in Newport Beach, Calif., and teaches at the Irvine, Calif., campus of National University.

COMPUTER INDUSTRY

12% to a 4.2% net profit margin.

There were numerous casualties, and the survival of many companies is in question. These companies include many in the IBM-compatible arena such as Eagle Computer, Inc., Fortune Systems Corp. and Vector Graphic, Inc.

Most of the strong performers in the smaller companies segment do not compete head-to-head with IBM and the other giants. Many

of the stars, however, supply or support the IBM marketplace.

Strong first-quarter 1985 results were posted by a host of companies, including

Apollo Computer, Inc., Ashton-Tate, Compaq Computer Corp., Computer Task Group, Cray Research, Inc., Cullinet Software, Inc., Software Publishing Corp., Sterling

Software, Inc., Stratus Computer, Inc. and many others.

The number of successes as compared with the setbacks has taken a backseat in the news. Most of the suc-

cessful companies are not high-profile companies; this suggests that the low-profile approach — for example, direct sales vs. mass marketing, customer service vs. stock market image, and so on — is a factor to success in a large, highly competitive market.

The outlook

The outlook for the computer industry continues to look strong. The buyers, however, are much more sophisticated than they were one year ago. These buyers are cautious, and they are placing increased demands on the sellers.

The keys to success, in both the good times and the bad times, especially for the smaller companies, have been to identify and serve market niches properly, not to try to be everything to everyone and to avoid mass advertising, IBM-commodity markets.

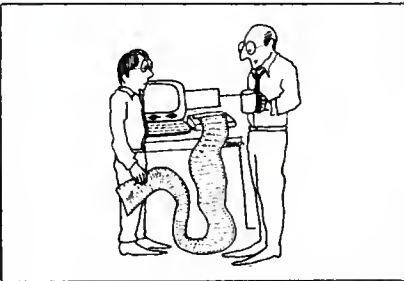
The largest companies in the computer industry serve the largest organization purchasers with the products that are the largest portion of these organizations' purchases. These, however, are the slowest growing as well as the most competitive markets.

Growth of niche marts

The smaller volume but more rapidly growing newer, niche markets provide greater opportunity for high profit margins and growth.

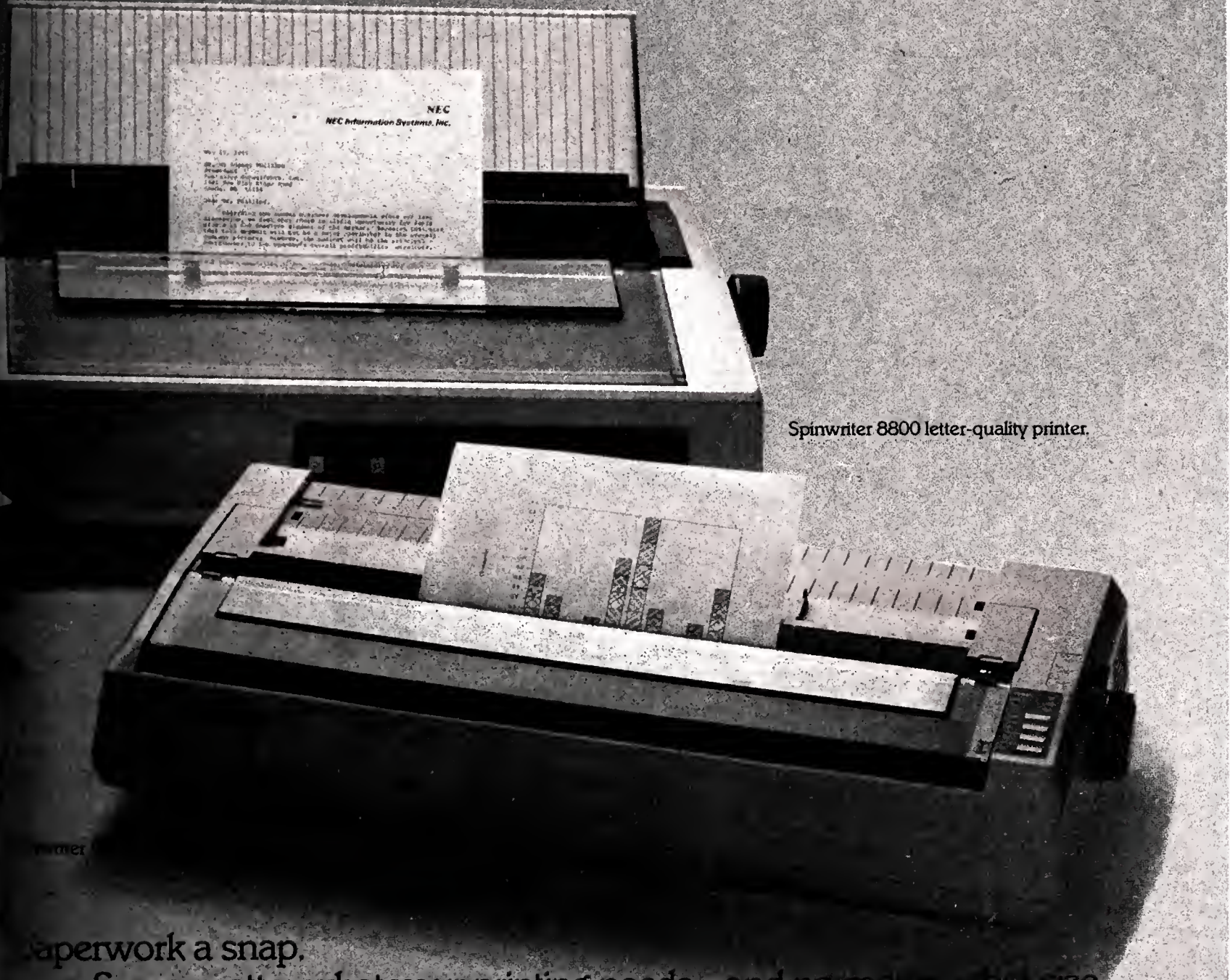
The demand for increased support and service related to specific needs will create even more varied products and vendors. The number of computer industry companies, in both the bad times and the good times, had grown and will continue to grow. The shake-up will continue.

The Dykstra Consultants' 75-page report, titled First Quarter '85, Public Computer Companies Results, will be available shortly. The price is \$195.



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Kaypro posts \$6.2 million third-quarter loss

SOLANA BEACH, Calif. — Kaypro Corp. announced it suffered a net loss of \$6.2 million for the third quarter ending May 31.

The portable computer manufacturer said the loss resulted from a revaluation of its inventory. The company said the revaluation prompted a subsequent \$9.8 million writedown.

Sales for the quarter totaled \$16.7 million, down 48% from \$32.5 million one year ago. Profits for the same period last year were \$3.2 million.

Robert Gorski, Kaypro's controller, said the generally sluggish computer market and the company's recent introduction of new-model 16-bit computers fueled the re-

valuation.

The company currently has assets of \$38 million and liabilities of \$13 million, Gorski said, and "will continue to be a significant player in the marketplace."

According to Gorski, the revaluation will make further adjustments for the rest of the year unnecessary.

Ken Lim, an analyst with

Dataquest, Inc., a market research firm in San Jose, Calif., said "this recent loss continues a trend Kaypro has been on for several quarters. [The firm] alternates small losses with break-even periods." According to Lim, the company's problems are caused by having too many overlapping products in the marketplace.

Firm merges CAD/CAM subsidiaries

ANN ARBOR, Mich. — Schlumberger Ltd. recently announced the consolidation of two major units of its Computer-Aided Systems (CAS) group. It combined the operations of Applicon, Inc. and Manufacturing Data Systems, Inc. (MDSI).

Applicon, formerly headquartered in Burlington, Mass., manufactures computer-aided design products. MDSI, headquartered here, is a maker of computer-aided manufacturing products. Both companies were founded in 1969.

According to a Schlumberger spokesman, the combined companies will retain the Applicon name. The spokesman added that the firms will be headquartered here.

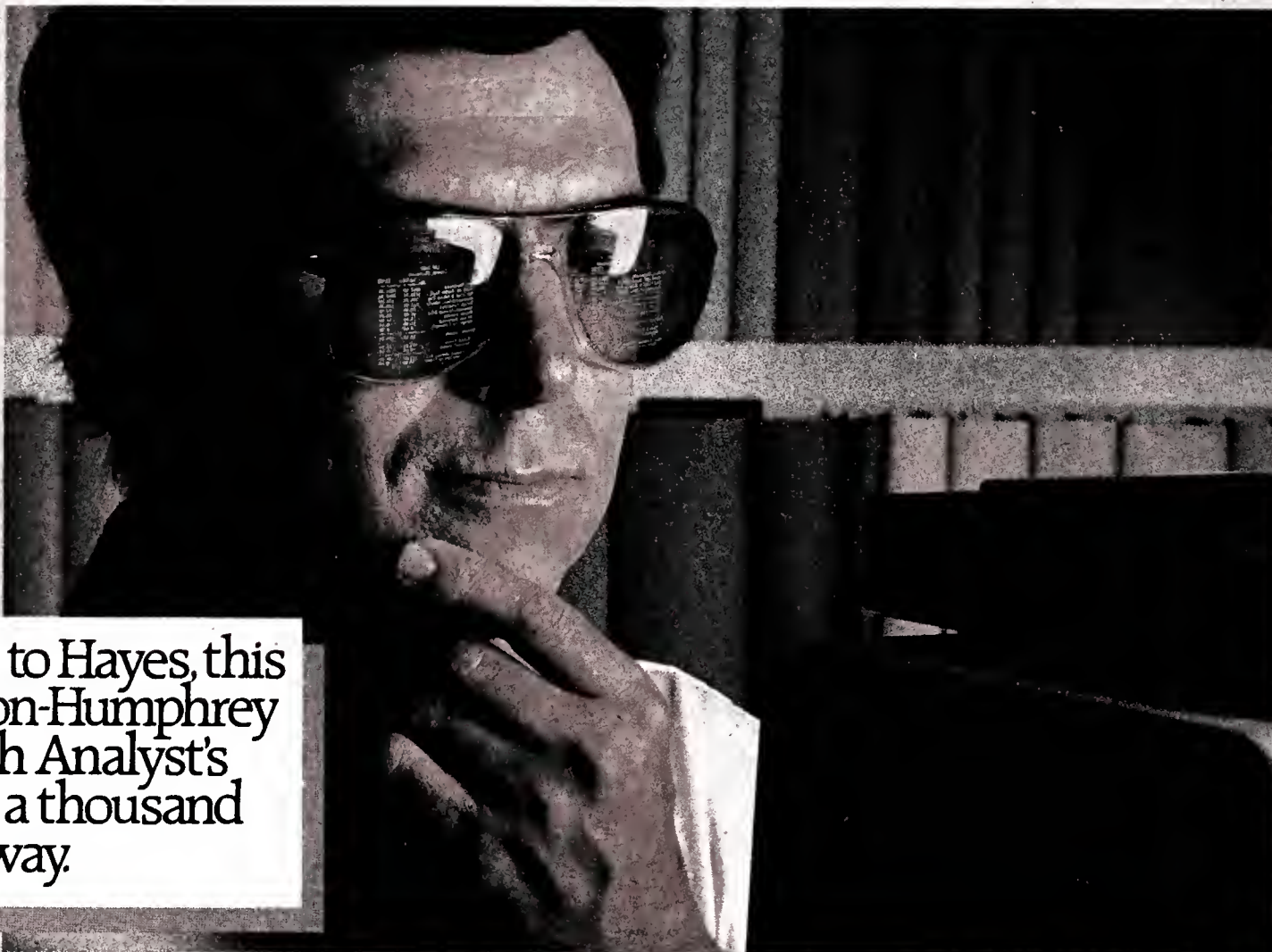
Sales arms left intact

Worldwide sales and service organizations of both companies will remain intact, Schlumberger said, and product development and manufacturing facilities in several states will continue operations.

Dick Morman, former general manager of MDSI, was named vice-president and general manager of the combined company. Alex Beavers, former president of Applicon, was named vice-president of marketing for Schlumberger's CAS group.

Additionally, Schlumberger announced the formation of the Electronic Design Automation group. The operations of the new group will encompass the very large-scale integration product line of Applicon and the automatic test generation facility efforts of Factron, another division of Schlumberger's CAS group.

Mr. John B. Moore, Jr., First Vice President, Financial Services Research, Robinson-Humphrey, Atlanta, Georgia.



Thanks to Hayes, this Robinson-Humphrey Research Analyst's mind is a thousand miles away.

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As a Financial Analyst for Robinson-Humphrey, a leading brokerage firm, Mr. Moore's responsibilities include researching financial institutions as to their investment quality.

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So rather than sort through thousands of hard copy reference sources, Mr. Moore relies instead on his Hayes communications system, which allows his computer to "talk" to commercial database mainframes over ordinary telephone lines.

With a simple keyboard command, his Hayes modem automatically dials up a modem-

equipped mainframe (or another personal computer for that matter), issues a password, logs on and informs Mr. Moore that the mainframe is on the line.

Never leaving his chair, he scans the vast electronic files, retrieves the needed information and composes a report on his screen.

But his Hayes modem and communications software aren't finished yet.

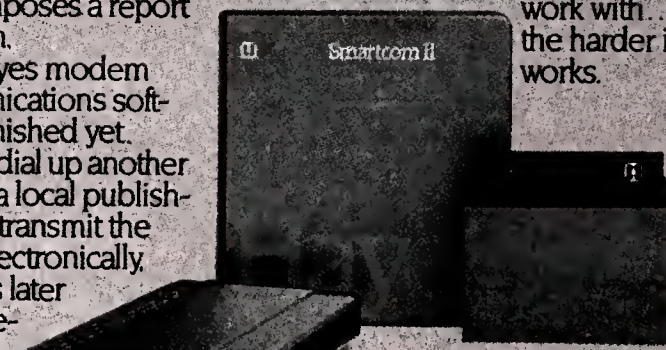
They then dial up another computer at a local publishing concern, transmit the document electronically, and 48 hours later the printed report is distributed to Robinson-Humphrey brokers.

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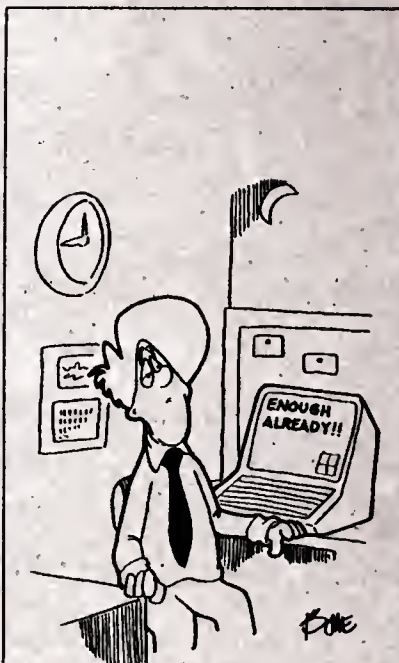
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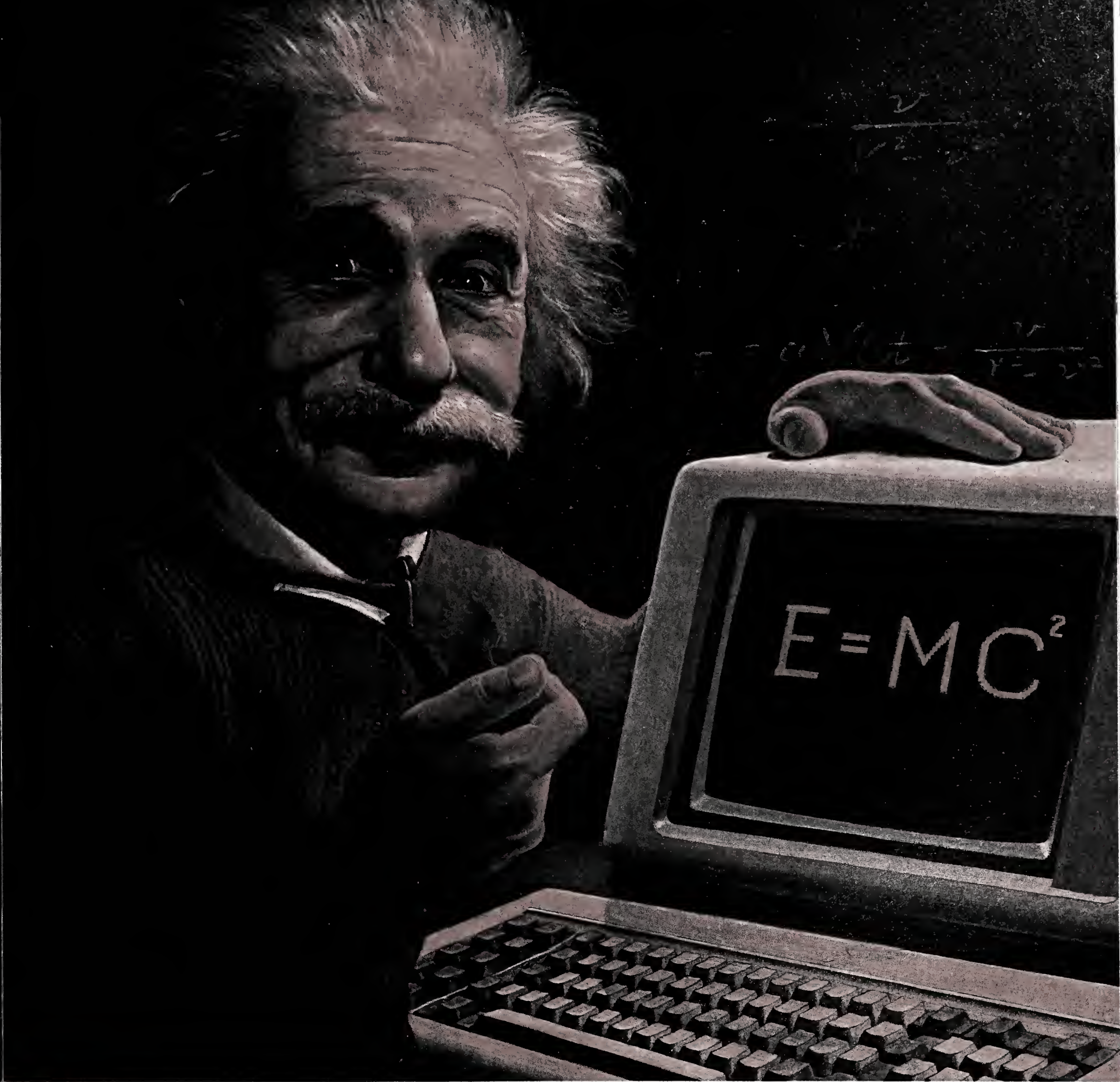


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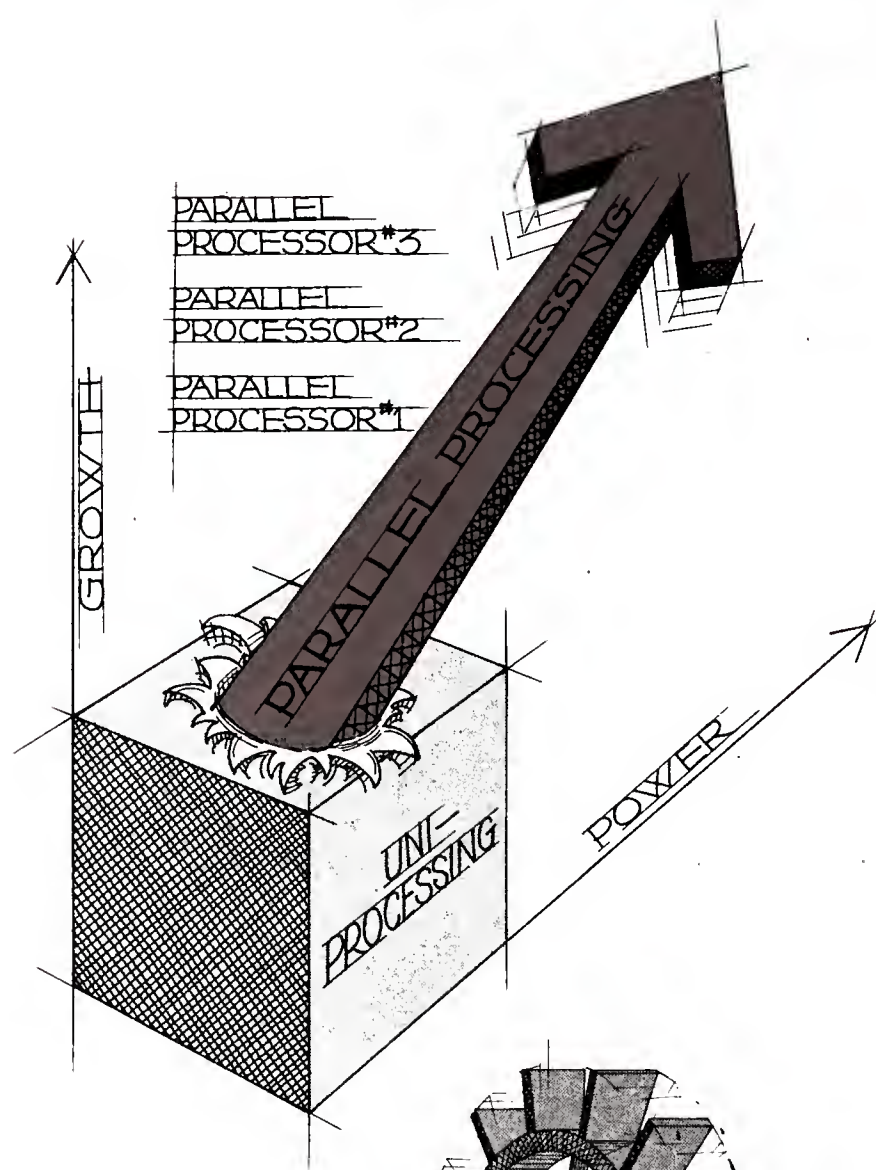
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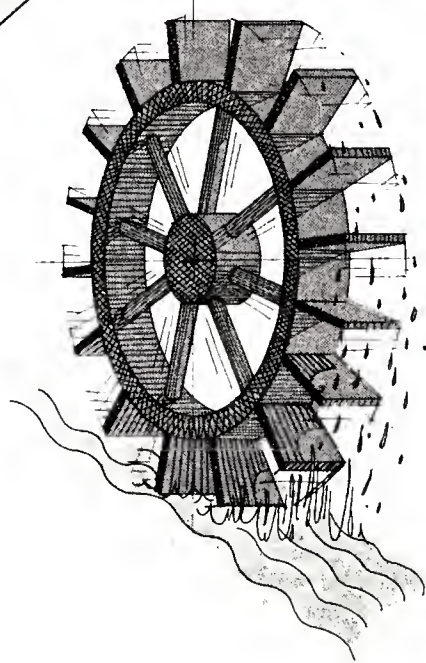


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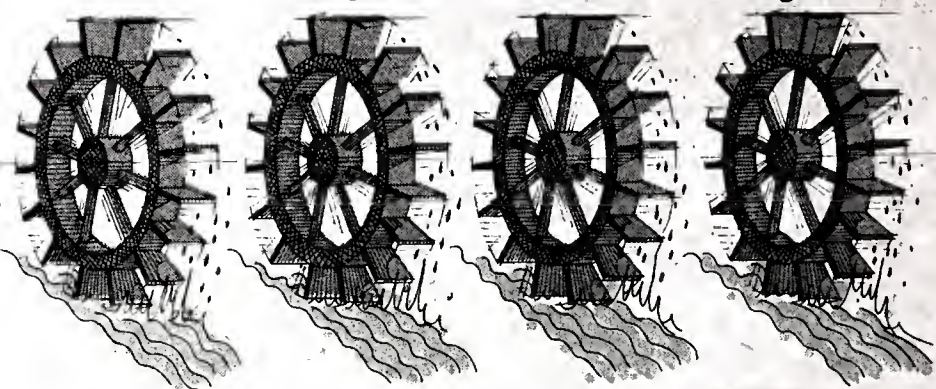
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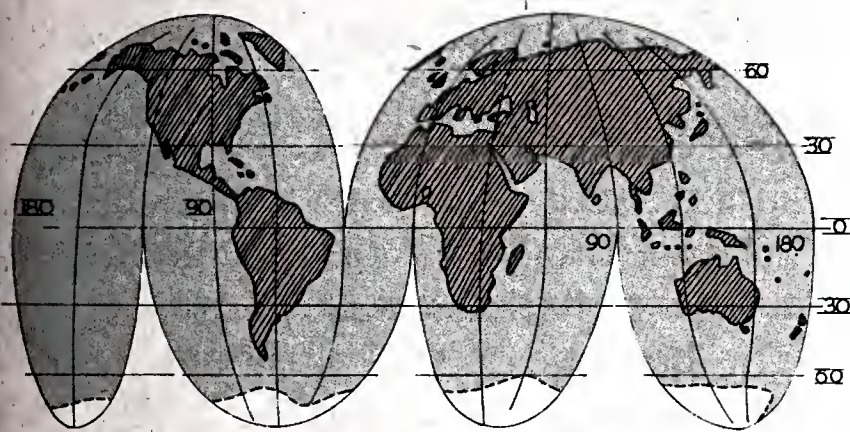
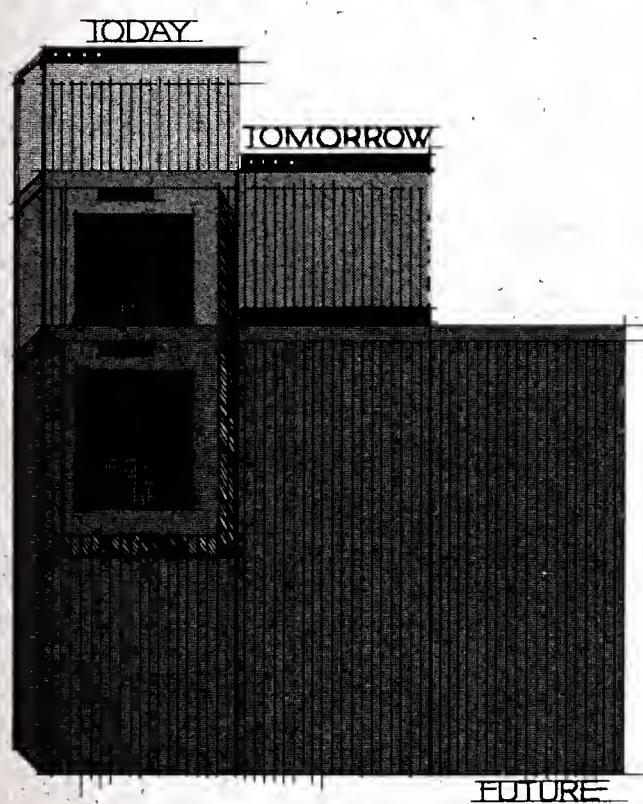
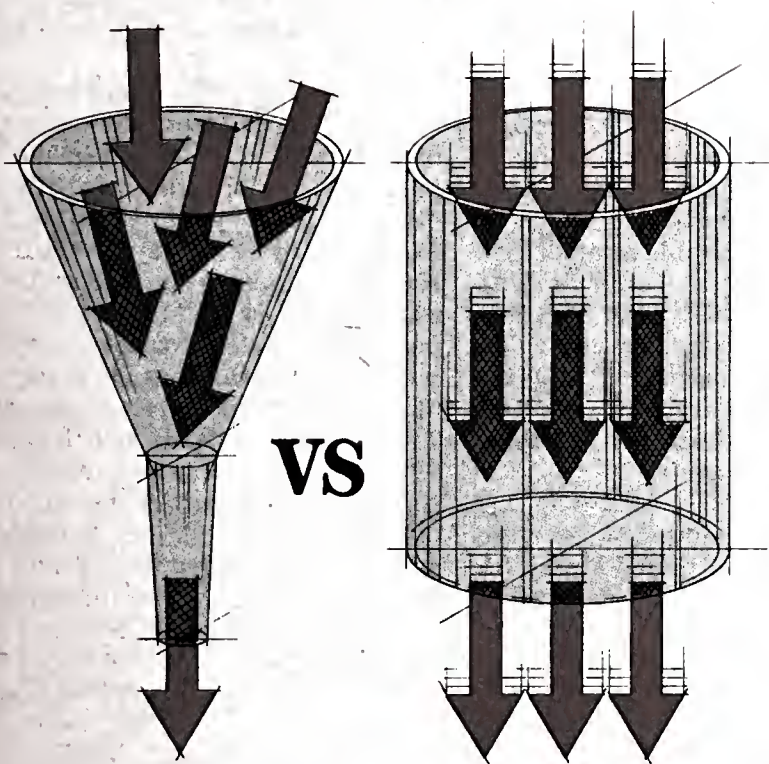
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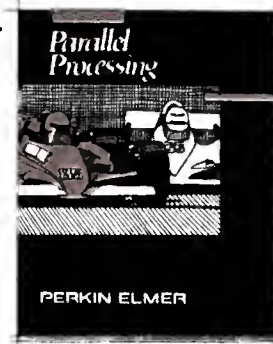
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Issco Corp. reported revenue for the first quarter ended March 31 of \$7.6 million, compared with \$5.9 million for the first quarter of last year. Profits were \$420,000, or 8 cents per share, compared with \$247,000, or 5 cents per share, in the corresponding period a year ago.

Software Publishing Corp. announced revenue for the second quarter ended March 31 of \$7.2 million, up 59% from \$4.5 million in the comparable quarter a year ago. Profits were \$972,000, or 14 cents per share, compared with \$493,000, or 9 cents per share, in the same period a year ago.

AST Research, Inc. reported profits for the three months ended March 31 of \$5.8 million, or 55 cents per share, compared with \$1.5 million, or 19 cents per share, in the like period a year earlier. Revenue was \$37.8 million, compared with \$20.1 million in the comparable period a year ago.

Computer Consoles, Inc. announced revenue for the quarter ended March 31 of \$25.9 million, down from \$27.2 million in the same quarter a year ago. There was a net loss of \$5.5 million, or 48 cents per share, compared with a net income of \$1.3 million, or 11 cents per share, in the comparable quarter a year earlier.

Sanders Associates, Inc. reported revenue for the third quarter ended April 26, increased 14% to \$219.8 million, compared with \$192 million in the like period last year. Profits were \$6.1 million, or 32 cents per share, compared with \$13.7 million, or 72 cents per share one year ago.

Dataproducts Corp. announced revenue for the fourth quarter ended March 31 of \$113.7 million compared with \$126.4 million in the same quarter a year ago. Profits were \$2.6 million, or 12 cents per share, compared with \$10.6 million, or 51 cents per share in the comparable period one year ago.

Vector Graphic, Inc. reported a net loss of \$1.4 million, or 19 cents per share, for the third quarter ended April 2, compared with a net loss of \$2.7 million, or 44 cents per share, for the like period a year ago. Revenue was \$903,000, compared with \$3 million in the same quarter last year.

Wicat Systems, Inc. reported revenue for the fourth quarter ended March 31 of \$9 million, up 53% compared with \$5.9 million a year ago. Wicat posted a loss of \$289,000, or less than 2 cents per share, compared with a loss of \$6.9 million, or 34 cents per share, in the comparable quarter one year earlier.

Micom Systems, Inc. announced revenue for the fourth quarter ended March 31 of \$51.5 million, compared with \$44.9 million one year ago. Profits were \$5.6 million, or 33 cents per share, compared with \$6.4 million, or 37 cents per share, in the like quarter a year earlier.

Syntrex, Inc. reported revenue for the second quarter ended April 26 of

\$14.9 million, compared with \$12.5 million in the same quarter one year ago. Profits were \$56,000, or 1 cent per share, compared with \$437,000, or 5 cents per share in the comparable period a year ago.

Anacomp, Inc. announced net income of \$6.4 million, or 33 cents per share, on revenue of \$31.8 million for the quarter ended March 31. A year earlier, the company reported a loss of \$27 million, or \$2.13 a share on revenue of \$35.4 million.

Floating Point Systems, Inc. reported revenue for the second quarter ended April 30 of \$30.2 million, compared with \$29.1 million in the like quarter a year ago. Profits were \$3.1 million, or 39 cents per share, compared with \$3.6 million, or 41 cents per share a year earlier.

ITT announced profits for the first quarter of \$113.3 million, or 75 cents per share, compared with \$79.3 million, or 52 cents per share, in the same quarter a year earlier. Foreign exchange decreased earnings by 8 cents during the quarter, compared with a 12 cents per share negative impact in the comparable quarter last year. Revenue for the quarter was \$4.7 billion compared with \$4.6 billion in the first quarter last year. The communications operations and information services segment reported results similar to those for the comparable period last year.

Tandy Corp. announced revenue for the third quarter ended March 31 of \$670 million, compared with \$656 million in the like period a year ago. Profits were \$21 million, or 25 cents per share, compared with \$62 mil-

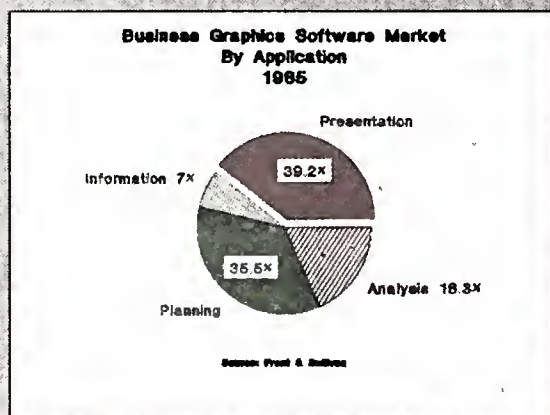
lion, or 60 cents per share, in the comparable period one year ago.

Britton-Lee, Inc. reported revenue for the first quarter ended March 31 of \$6.5 million, a 76% increase, compared with \$3.7 million for the same quarter last year. Profits were \$938,000, or 12 cents per share, representing income before extraordinary credit of \$534,000, or 7 cents per share, and an extraordinary credit from using tax-loss carryforwards of \$404,000, or 5 cents per share. This compares with net income of \$386,000, or 6 cents per share, representing income before extraordinary credit of \$212,000, or 3 cents per share, and extraordinary credit from using tax-loss carryforwards of \$174,000, or 3 cents per share, for the quarter ended March 31, 1984.

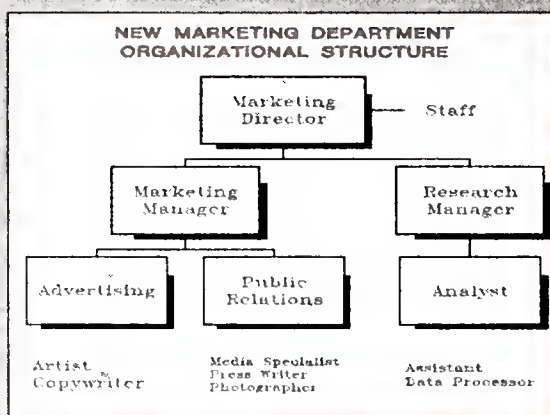
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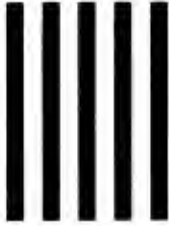
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COMPUTER INDUSTRY

NICKELS from page 86

Rand Information Systems, Inc. announced audited financial results for the fiscal year ended Feb. 24. The company reported a net loss of \$1.2 million, or 50 cents per share, compared with net income of \$10,000, or 4 cents per share, in the previous year. Revenue was \$11.1 million, compared with \$12.6 million a year ago.

BPI Systems, Inc. reported results for the three-month period ended March 31. The company reported a pretax loss of \$441,000, and an after-tax loss of \$211,000 or 4 cents per share, on revenue of \$2.3 million. The results compared with a pretax loss of \$617,000 and a combined after-tax loss of \$660,000, or 12 cents per share, on revenue of \$2.6 million in

the corresponding period a year ago.

Dynatech Corp. announced revenue for the quarter ended March 31 of \$54.3 million compared with \$39.1 million a year ago. Before extraordinary gain, pretax income was \$7.7 million, compared with \$4 million for the like quarter a year ago, and income from operations was \$4.4 million, or 45 cents per share, compared with \$2.2 million, or 24 cents per share for the same period one year ago.

Gerber Scientific, Inc. reported revenue for the fourth quarter ended April 30 of \$64.4 million, compared with \$53.7 million in the like period a year ago. Profits were \$6.5 million, or 38 cents per share, compared with \$5.1 million, or 30 cents per share, one year ago.

Computer Memories, Inc. reported fourth-quarter revenue ended March 31 of \$39.3 million, a 212% increase over last year's fourth-quarter revenue of \$12.6 million.

Computer Memories' profits were \$2.6 million, or 24 cents per share, compared with \$412,000, or 4 cents per share, in the comparable period one year ago.

Continental Information Systems Corp. reported revenue for the quarter ended Feb. 28 of \$75.6 million, compared with \$29.7 million in the like quarter a year ago. Profits were \$2.2 million, or 42 cents per share, compared with \$1.7 million, or 32 cents per share, in the previous year.

Centronics Data Computer Corp. announced revenue for the first

quarter ended March 31 of \$53.8 million, compared with \$39.5 million in the comparable period last year. Net loss for the quarter was approximately \$1.3 million, or 11 cents per share, compared with a loss of \$1.9 million, or 17 cents per share, in the like period a year ago.

Scientific Micro Systems, Inc. reported a net loss of \$175,000, or 2 cents per share, on revenue of \$8.7 million for the first quarter ended March 31. A year earlier, the company reported a net income of \$959,000, or 18 cents per share, on revenue of \$9.6 million.

Computer and Communications Technology Corp. announced revenue for the first quarter ended March 30 of \$24.5 million, compared with \$27.5 million one year ago. Profits before an extraordinary tax benefit were \$137,000, or 2 cents per share, compared with \$2.3 million, or 30 cents per share, for the first quarter a year ago.

An extraordinary tax benefit of \$291,000, or 4 cents per share, increased the 1984 net income to \$2.6 million.

Western Union Corp. has announced a net loss for the three months ended March 31 of \$15.3 million, or 88 cents per share, compared with profits of \$14.1 million, or 50 cents per share, in the like period a year ago. Revenue was \$284 million compared with \$261 million one year ago.

Computer Devices, Inc. reported a loss for the quarter ended Dec. 29 of \$2.2 million, or 57 cents per share, compared with a loss of \$9.4 million, or \$2.39 per share, in the comparable period a year ago. Revenue was \$1.5 million, compared with \$1.7 million a year ago.

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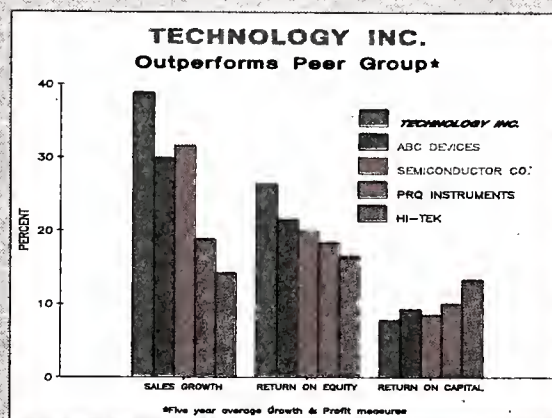


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Job Performance and Satisfaction			
What is their value to an organization?			
DESIGN CONCERN	HAS AN EFFECT ON		
	Job satisfaction	Job performance	Ease of communication
Degree of enclosure			✓
Temperature	✓		
Lighting	✓	✓	
Access control		✓	
Noise	✓		

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EXECUTIVE CORNER


James K. Dutton has been named president and chief executive officer of System Industries, Inc. Dutton's previous experience includes product marketing management at IBM and Storage Technology Corp. and serving as vice-president of marketing at Amdahl Corp. Most recently Dutton served as president and chief executive officer of Caere Corp.

Spectrum International, Inc. has announced the appointment of **Rand W. Tuttle** as president and chief operating officer, replacing **John Toellner** who moves to chairman and continues as the company's chief executive officer.

Pertec Computer Corp. has announced the appointment of **Edward E. Hale** to president. Most recently he was vice-president of marketing at Triumph-Adler North America. He has also served as president of Royal Business Machines.

Irwin Magnetics has elected **Edwin F. Carlson** as president and chief operating officer and to membership on the board of directors. **Herbert S. Amster**, who had been president and

See EXEC page 95

A high-contrast black and white photograph of a checkered floor, likely in a large hall or atrium. The floor is composed of large, light-colored square tiles separated by dark grout, creating a strong geometric pattern. Long, dark shadows of people are cast across the floor, indicating a low sun position. In the upper right, two figures in business attire are visible, one standing and one partially obscured. The overall mood is dramatic and architectural.

**“Promises pro
Somebody**



**computers.
ing it all together.”
Somebody is.**

With more than 70 and enhancements, complete solutions

A few weeks ago, AT&T made a major computer announcement. Major in every way.

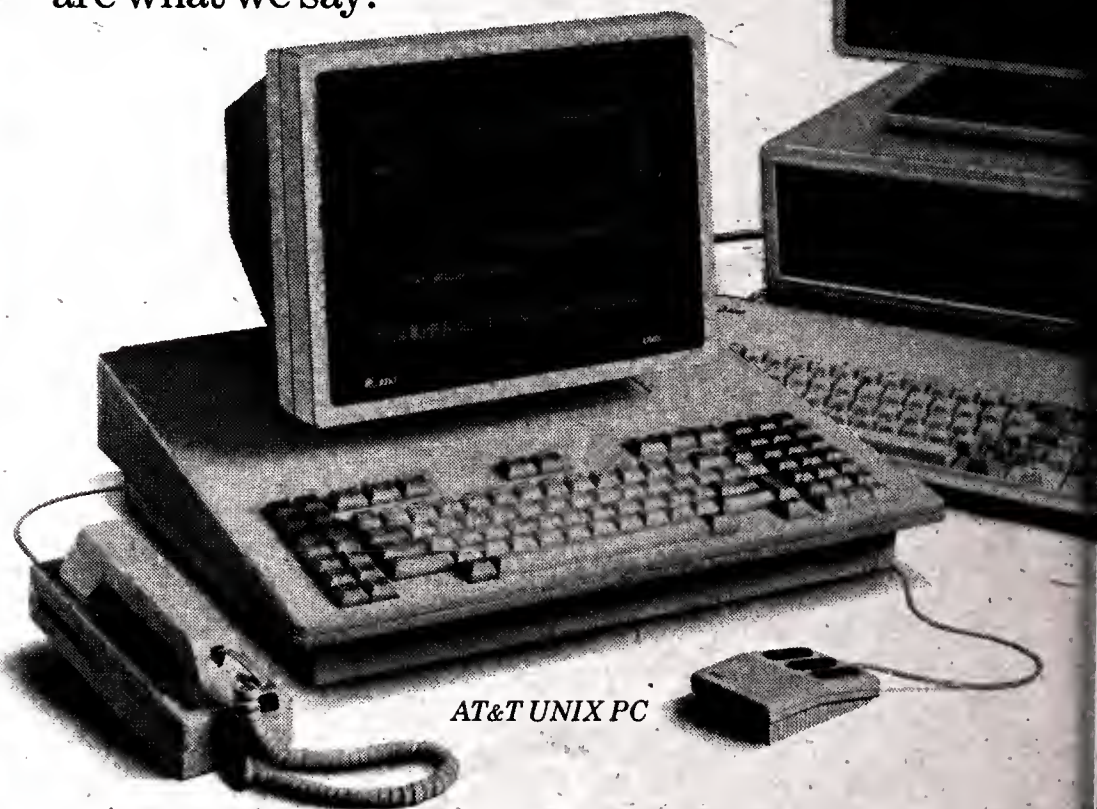
Certainly in the depth and breadth of the offering—which includes computers, peripherals, software, networking options, communications products and much more.

Major in terms of AT&T's growth as a force in the computer industry. Consider the new, enhanced and existing products. You'll find our line of integrated communications-based computers runs the gamut from PCs to superminis.

What's more, they can be connected easily to each other and to your mainframes. They're readily expandable, too, bringing a new level of productivity to your business.

AT&T PC 6300

Most importantly, the announcement reinforces in a major way AT&T's commitment to computers. Tangible proof that our products are what we say:



The Computers With The Future Built In. Our computer line now includes the following:

Computers: To serve an entire office, our recently enhanced line of AT&T 3B Computers puts the flexibility and power of the UNIX™ Operating System to work for you.

There are five models. Our new 3B2/400 can accommodate up to 46 different peripherals (terminals, printers, modems, etc.). The new 3B15 up to 128.

AT&T.

new computer products

AT&T is now fully equipped to offer to your computer needs.

The 3B2/300 and 3B5 have both been enhanced with many features for better performance. The former can accommodate up to 18 different peripherals; the latter up to 128. The 3B20 has room for up to 256 peripherals.

The AT&T PC 6300 is for the single user in need of a superior MS-DOS* business computer. It can also run the Xenix* operating system.

For single or multi-user situations, the AT&T

UNIX PC offers a

unique combination of power, ease of use and advanced communications capabilities.

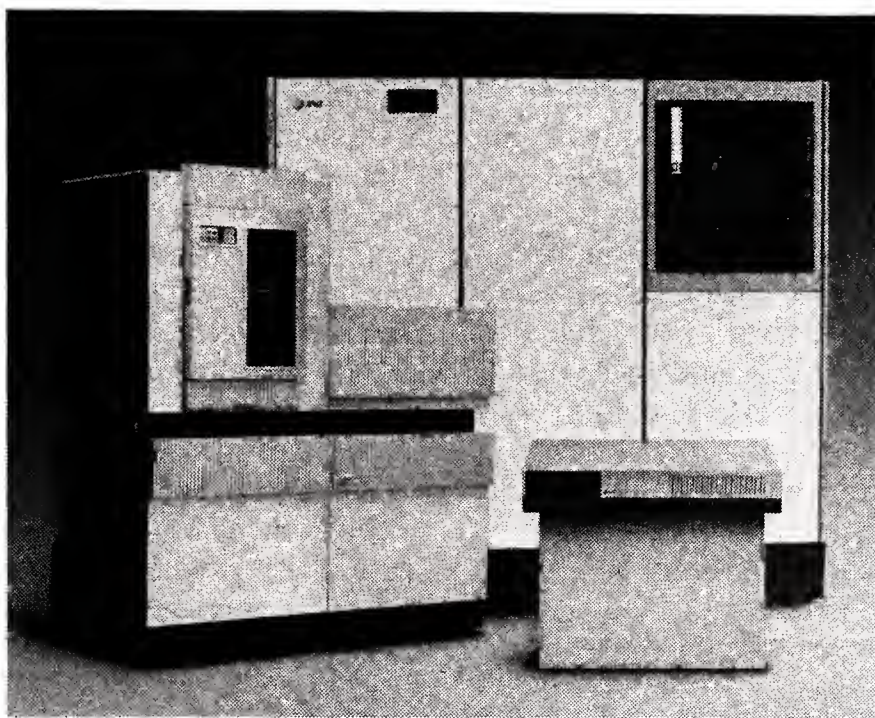
Communications: AT&T has always led the way in telecommunications. That leadership continues in computers. Our computers and communications products link together, allowing voice and data integration and shared information from PC to mainframe.

We now offer a complete line of low to high-end data communications products and service giving you complete control over the management of your data network.

Those with a major investment in mainframe computers can rest easy. Now you can enjoy complete end-to-end connectivity. We now support popular SNA and BSC protocols, which means our computers and systems can communicate and work with your mainframes. Your investment is protected.

Peripherals: We offer a full line of high-performance, highly reliable synchronous and asynchronous terminals and printers. They're highly compatible, too, with our own and other computers.

Software: Choose from a large and growing list of applications software based on UNIX System V. Some handle general business, such as word processing, financial spreadsheets, and business graphics. And some tackle specific needs of spe-



THE COMPUTERS WITH THE FUTURE BUILT IN

cific industries, including, accounting, automotive and retailing.

You'll also have the ways and means and tools to develop your own software.

The Future Looks Even Brighter

You'll find that all of these computer products are designed to work with your current system, while offering an almost unlimited variety and number of options for growth and change.

You know that when you buy an AT&T Computer product, you're making the right choice—and you're giving yourself more choice. Our flexibility gives you more options when the time comes to expand.

What's more, you'll find these high-quality products comparable, often superior, in price and performance. Which makes them an excellent investment.

AT&T also protects your investment by offering overall comprehensive service and support for computer hardware and associated software products.

This includes Customer Programming Services Centers, where we'll help you to develop your own software or customize existing packages. Implementation Services and Customer Training offer expert advice on the most efficient, productive use of your system.

Our National Software Support Center provides a 24-hour hotline for hardware and software support.

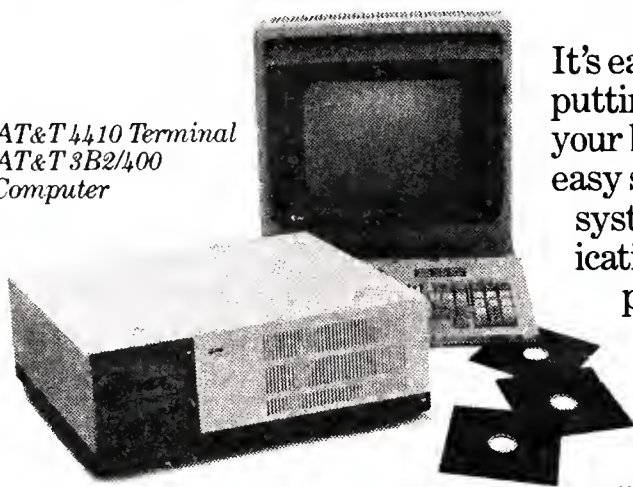
Our service options are another way we're working to help you pull the pieces together in a logical, coherent way.

In every way, we're working to make The Computers With The Future Built In work best for you.

For a more detailed look at what AT&T Computer products can do for you, just turn the page.

See how AT&T Computer products can make your system work as a system.

AT&T 4410 Terminal
AT&T 3B2/400
Computer



It's easy to get started putting AT&T to work for your business—in small easy steps or a complete system. These communications-based computer products are designed to work with each other, and with your existing system. Start with the newly enhanced 3B2/300 or

the new 3B2/400 to develop a distributed departmental system. Both are true 32-bit computers that run UNIX System V. The 3B2/400 offers full hardware floating point performance, streaming tape backup, and up to 4 MB of main memory. Supporting up to 10 or 25 users respectively, the 3B2/300 and 3B2/400 offer plenty of room for tape and disk storage growth.

For even higher storage capacity and performance, build your system around the enhanced 3B5 or the new 3B15 minicomputers.

The 3B15 is equipped with a high-performance WETM 32100 microprocessor with main memory up to 16 MB. It supports up to 60 users on a number of configurations. Other features include demand paging memory management with file and record locking and standard floating point performance.

To over 500 tested software packages already listed in the **AT&T Computer Software Guide**, we're adding more applications programs, such as UltraCalc^{**} and CrystalWriter^{***}. For systems developers, high level languages for 3B Computers such as UX-Basic[†] and Micro Focus Level II Cobol^{††} open the world to thousands of additional software applications running in the UNIX System V environment. And AT&T can address unique business needs with software solutions specifically for vertical markets such as accounting, real estate, and automotive industries. IBM^{†††} mainframe VM users now have UNIX System V develop-

ment capabilities through our System V-VM software.

It should come as no surprise that AT&T is the leading producer of advanced data communications equipment. To our already large and growing list we've added **DATAPHONE[®] I**, a complete line of synchronous, private line, analog, non-diagnostic modems with speeds from 2400 BPS to 14.4 KBPS. Also available is **DATAPHONE I Plus Service Management**, which provides you with private line network



Dataphone I Modems

management through AT&T, eliminating the need for an in-house staff.

DATAPHONE II is a family of digital and analog modems, multiplexers, and diagnostic control devices for multilevel network management and control. To the family we just added the **DATAPHONE II Model 2600 Digital Data Service Unit**, an integrated DSU and Channel Service Unit in one compact, easy-to-install and operate unit. Plus, it is fully compatible with the

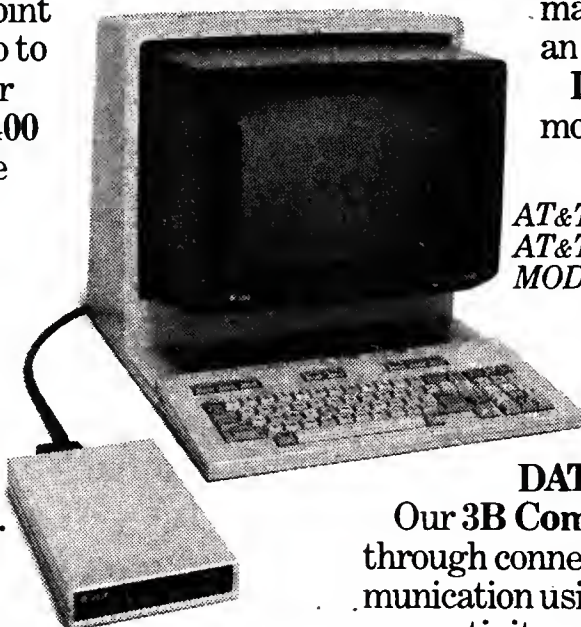
DATAPHONE II equipment you're using now.

Our 3B Computers work with your IBM mainframes through connectivity products that allow full interactive communication using BSC and SNA/SDLC protocols. The new host connectivity products include the **SNA/3270 Emulator +** software which emulates a fully configured SNA IBM 3274 controller, and the **BSC/3270 Emulator +** which emulates the BSC IBM 3274 Cluster Controller. And C language programmers can use a library of **AT&T Application Program Interface** access routines to communicate directly with a host computer in a 3270 mode.

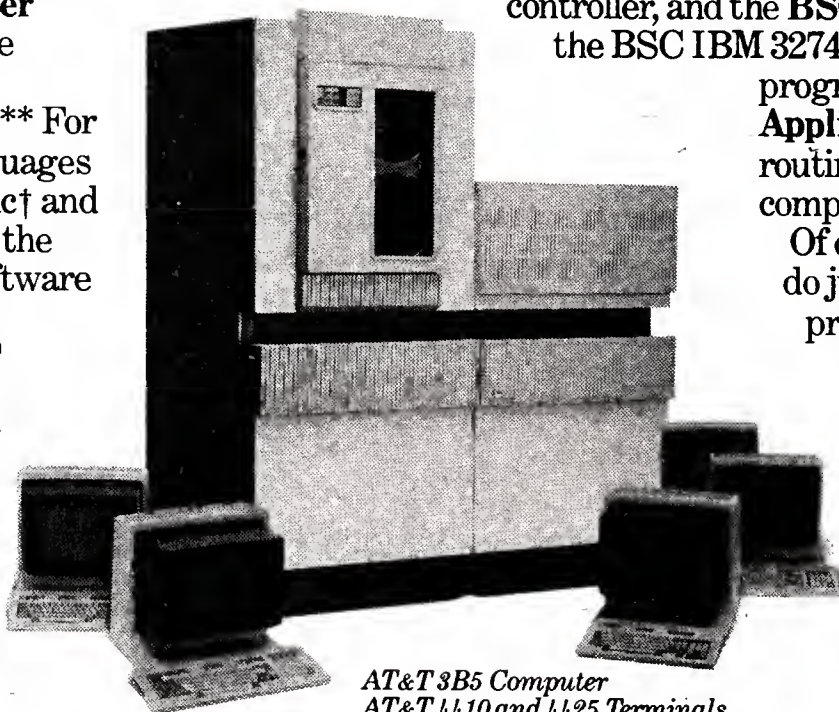
Of course, one advertisement can't begin to do justice to the full line of AT&T Computer products. There's much more to talk about.

For more details, contact your AT&T Information Systems Account Executive, authorized AT&T Representative, or call 1 800 247-1212.

Do it today—and start building a completely integrated business communications system. With the one company that can pull it all together.



AT&T 4410 Terminal
AT&T Model 4000
MODEM



AT&T 3B5 Computer
AT&T 4410 and 4425 Terminals

^{*}MS-DOS and Xenix are trademarks of Microsoft Corp.
^{**}UltraCalc is a trademark of Olympus Software, Inc.
^{***}CrystalWriter is a trademark of Syntactics Corporation.
[†]UX-Basic is a trademark of UX Software, Inc.
^{††}Micro Focus Level II Cobol is a trademark of Micro Focus, Inc.
^{†††}IBM is a registered trademark of International Business Machines Corp.



AT&T
The right choice.

COMPUTER INDUSTRY

EXEC from page 89

chief executive officer, has been elected chairman of the board.

Steve Tatum has been named president of Selanar Corp. replacing Founder and former President Barry Southard, who moves into the position of vice-president of engineering. Tatum's most recent position was vice-president of sales and marketing for Televideo Systems, Inc.'s Terminal Division and has been employed at Acro, a division of C. Itoh Digital Products, Inc. and

Beehive International, Inc.

Continental Telecom, Inc. has announced the appointment of William Y. O'Connor as president of its Executone, Inc. subsidiary. Also Ronald H. Silverman, Executone's current president, will join the parent company's headquarters staff as vice-president, planning of the corporation's business product sector. Both appointments become effective June 1.

John J. Schickling has been appointed president of Telesis Systems Corp. Schickling has held positions

at General Electric Co. and Computervision Corp.

NBI, Inc. has announced the appointment of executive vice-president Mark J. Stevenson to the position of general manager of NBI's new office systems division.

Computer Communications, Inc. President and Chairman Raymond E. High announced that he will step down as president and chief executive officer effective Aug. 1, but will remain active in company affairs as chairman.

Charles Skibo has been named president of U.S. Telecom, Inc., succeeding William Esrey who will become president and chief executive officer of United Telecommunications, Inc.

California Devices has announced the following appointments: Douglas Ritchie to president and chief executive officer and Wilmer Bottoms to chairman of the board.

Gandalf Technologies, Inc. has announced the following appointments effective Aug. 1: Desmond Cunningham will assume the newly created post of chairman and chief executive officer, and Colin D. Patterson will become president and chief operating officer. Also announced were two appointments effective immediately: Jan Bartl has been appointed vice-president of product development, and Brian K. Penney has been appointed director of technology.

Honeywell, Inc. has named Peter Dressen vice-president of software development operations for Honeywell's large computer products division, headquartered in Phoenix.

Simon Hunt has been appointed president and chief executive officer of Apricot, Inc. Hunt was previously a partner at Peat Marwick, chartered accountants in England.

Scientific Micro Systems, Inc. has appointed Charles Mathews president and chief executive officer. Mathews succeeds Hugh Kern, who will retire after leading the company as president and CEO since 1972.

Edward Watson has been named president and chief executive officer of Higher Order Software, Inc.

Robert Stoeber has been appointed president of Digital Learning Systems, Inc. The company also announced that George Black and Ralph Stoeber have each been promoted to the position of executive vice-president.

**MERGERS AND ACQUISITIONS**

Interface Systems, Inc. and Nematron Corp. revealed several details of a financial agreement calling for an investment to be made by Interface Systems in Nematron. In return, Interface will be able to acquire all of the outstanding shares of Nematron by exercising a one-time option. Interface Systems manufactures computer printers that are compatible with IBM 3270 terminals and System/34, 36 and 38 minicomputer systems.

Information Solutions, Inc. and Prime Computer, Inc. have entered into a warrant purchase agreement. Under the terms of the agreement, Information Systems grants Prime a warrant to purchase 253,059 shares of Information Systems's common stock, representing approximately 10% of the firm's shares outstanding at the time the agreement was announced by the firms.

The Dun & Bradstreet Corp. has completed its divestiture of TSI International Ltd. to a group headed by Vanguard Atlantic Ltd. The name TSI International will be retained by the new company. Terms of the agreement were not disclosed.

Genisco Technology Corp. announced it has acquired the custom products operations of Data Electronics, Inc. of San Diego. The value of the total transaction was approximately \$3.5 million, including certain prepaid royalties, licenses and other tangible and intangible items.

See **MERGER** page 96

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COMPUTER INDUSTRY

MERGER from page 95

Bankamerica Corp. announced the sale of **Decimus Corp.** to **General Electric Credit Corp.** of Stamford, Conn. Decimus, which finances high-technology equipment to major corporate customers, has been controlled by Bankamerica since 1969. It currently has an asset base of about \$170 million.

Software Integration, Inc. announced that it has acquired Mountain View, Calif.-based **Infotools, Inc.** The price of the acquisition and other terms of the agreement were not disclosed.

Zenith Electronics Corp. announced that it has entered into a definitive agreement to acquire **Inteq, Inc.** of Herndon, Va., in exchange for Zenith common stock. The exact number of shares of Zenith stock to be issued could vary from 800,000 to 1 million, depending upon the average closing price of Zenith common stock on the New York Stock Exchange during an agreed base period.

Personal CAD Systems, Inc. of Los Gatos, Calif., has agreed in principle to sell its architectural, engineering and construction division to the Anaheim, Calif.-based **Calcomp Group** of **Sanders Associates, Inc.** in a transaction valued at almost \$7.5 million.

Ameritech Development Corp. of Chicago announced it has purchased a minority interest in **Davox Corp.**, a privately-held developer and supplier of integrated voice and data workstation communications systems headquartered in Billerica, Mass., for an undisclosed amount.

Engineered Systems & Development Corp. of San Jose, Calif., has reached an agreement in principle to acquire the assets and business of the **Seaborn Division** of Santa Clara, Calif.-based **Xidex Corp.** Terms of the acquisition were not available.

Seagate Technology, Inc. of Scotts Valley, Calif., announced completion of the previously announced acquisition of **Grenex, Inc.** in exchange for 3.1 million shares of Seagate common stock.

Electronic Memories & Magnetics Corp. (EMM), Encino, Calif., and **Titan Systems International, Inc.**, La Jolla, Calif., jointly announced that they have entered into an agreement in principle for a merger of the two companies. The transaction will be structured as a pooling of interests, whereby approximately 4.2 million shares of EMM stock will be issued to Titan shareholders.

Computer Task Group, Inc. (CTG) and **Dataware, Inc.**, both based in Buffalo, N.Y., jointly announced they have reached an agreement for the sale of 100% of Dataware stock to CTG.

Martin Marietta Corp., Bethesda, Md., and **Verdix Corp.**, McLean, Va., announced that Martin Marietta has agreed to acquire a 10% equity interest and options to acquire up to 24% of Verdix, a company specializing in secure computer and communications systems as well as in software development systems for the U.S. Department of Defense's Ada program-

ming language.

Bridge Communications, Inc., Mountain View, Calif., has acquired **Coherent Systems, Inc.**, a Bedford, Texas-based manufacturer of broadband radio frequency modems. Terms were not disclosed.

An agreement in principle has been reached that will merge **The Exchange System** with the one-year-old **Northwest Electronic Network**, Seattle. The merger is set to take place in phases over the next three years.

General Automation, Inc., Anaheim, Calif., has entered into an agreement in principle with **Helix Circuits, Inc.**, of Toronto for Helix to acquire the business of the National Technology division of Technology

Circuit Design, Inc., a wholly-owned subsidiary belonging to General Automation.

Wyle Laboratories, El Segundo, Calif., has completed the acquisition of **Applied Research, Inc. (ARI)** of Los Angeles for an undisclosed number of shares of Wyle common stock. ARI has now become an operating division of Wyle's Scientific Services & Systems Group.

Ingram Software of Nashville, a division of Ingram Distribution Group, Inc., and **Software Distribution Services, Inc.**, Buffalo, N.Y., announced Ingram's intention to purchase all of the common stock of Wincorp, the parent company of Software Distribution Services, Inc., including Wincorp's 50% equity interest in **Aviva Software Corp., Ltd.**

of Canada. The transaction is for an undisclosed amount of cash.

Softsel Computer Products, Inc., Inglewood, Calif., announced that it has signed a letter of intent to acquire **Intermicros, Inc.**, Key Biscayne, Fla., a supplier of personal computer software to Spanish-speaking countries.

Terak Corp., Scottsdale, Ariz., and **Sanders Associates, Inc.**, Nashua, N.H., announced that they have entered into an agreement in principle for the purchase of Terak by Sanders for approximately \$3.7 million, or about 50 cents per share.

As part of the transaction, Sanders will assume Terak's business obligations. Terak has filed for reorganization under Chapter 11 of the U.S. Federal Bankruptcy Act.

Announcing the only devoted entirely to

*Sponsored by MACWORLD,
the Macintosh Magazine,
August 21-23, 1985, Bayside
Exposition Center, Boston*

The second standard in business computing has arrived, and it's called the Macintosh Office. The power, flexibility, and ease of use of the Macintosh offer you the alternative you've been waiting for. And the introduction of the Macintosh Office provides all levels of business with a choice.

The Macworld Exposition is your chance to see it all in one place—software, hardware, and peripherals developed for the Macintosh. See for yourself the products available now that will help you work faster, easier, and smarter.

All of the elements of the Macintosh Office will be on display. The 512K Macintosh, the LaserWriter, and AppleTalk™, as well as Jazz™ from Lotus™, are just a few of the products you'll get to see.

The Macworld Exposition has a targeted schedule designed to fit your busy schedule. As a dealer, a distributor, a retailer, a business user, or an educator, the three-day conference and exposition is designed for you.

Day one is for dealers, distributors, retailers, and other third-party vendors to talk to Apple and the 100+ exhibiting companies about their products.

Days two and three are specifically geared for people interested in the Macintosh as a tool for business and anyone else interested in the Mac.

Who should attend?

Industry: Dealers, distributors, retailers, wholesalers, manufacturers, systems houses, consultants, technical programmers, all other ISOs

Business: CEOs, presidents, vice presidents, managers, comptrollers, owners/partners

Professionals: Doctors, nurses, bankers, lawyers, engineers, stockbrokers, real estate and insurance agents, CPAs, consultants

Education: Administrators, faculty, students

Here's a look at some of the conference sessions designed for you:

- The Outlook for the Mac in the Office
- Developing Software for the Macintosh
- How to Start and Survive in Business with a Macintosh
- Maximizing MacPaint®
- The Mac Clinic
- A Guide to Better Business Graphics
- Maximizing MacWrite®
- Database Management on the Macintosh
- Getting the Most out of Spreadsheet Programs
- How to Get Your Programs Published
- What's Available in Mac Software
- File Management Tips and Techniques
- Maximizing Macintosh Disk Storage
- The Mac in the Classroom
- The Mac in Higher Education
- Developing University Courseware with a Macintosh

COMPUTER INDUSTRY

Continental Telecom, Inc. (Contel) and **Northern Data Systems, Inc. (NDS)** announced the execution of a definitive agreement under which Contel will acquire NDS in an exchange of stock.

Under the agreement, Contel will pay \$11 in Contel common stock for each NDS common share. NDS has approximately 3,200,000 shares outstanding or subject to unexercised stock options.

An agreement in principle was announced by **Sperry Corp.** and **Formation, Inc.** for Sperry to acquire the **Southern Bell, U.S. Navy** and various other third-party computer service businesses of **Formation, Inc.** The businesses exceed \$5 million in annual service revenues.

Soft-Switch, Inc., King of Prussia,

Pa., announced the acquisition of **Network Applications, Inc.** of Austin, Texas. Soft-Switch, a privately held company, did not disclose the financial terms of the acquisition.

Intran Corp. of Minneapolis announced the sale of certain assets and related businesses of its information services group to **National Computer Systems, Inc.**, which took effect April 15, 1985.

Terms of the sale were not disclosed.

Pactel Info Systems, a subsidiary of Pacific Telesis Group, has signed a letter of agreement to purchase Portland, Ore.-based **Byte Shops Northwest, Inc.**

As part of the agreement, Pactel Info Systems will acquire the eight computer retail outlets and two cor-

porate sales divisions currently being operated in Oregon and Washington by **Byte Shops**.

Database Technology Corp., a company specializing in systems software to improve data processing productivity, has been purchased by its president, **Donald Dean**, through a leveraged buyout.

Personal CAD Systems, Inc., Los Gatos, Calif., has agreed to acquire San Jose, Calif.-based **Assisted Technology, Inc. (ATI)** for undisclosed terms. ATI designs and sells CUPL, an industry-standard software package that is used to implement logic designs in programmable logic devices.

Resources, Inc., Falls Church, Va., has entered into an agreement to ac-

quire **TRT Communications, Inc.** from **United Brands Co.** The leveraged buyout-type transaction cost Resources approximately \$56 million in cash.

Control Data Corp., Minneapolis, has acquired **Computer Maintenance, Inc.**, a third-party computer maintenance vendor based in Denver. Terms of the agreement were not disclosed.

National Technology, Irvine, Calif., a manufacturer of multilayer circuit boards, has been sold by Anaheim-based **General Automation, Inc.** to **Helix Circuits (USA), Inc.**, a wholly owned subsidiary of Helix Circuits, Inc., a Canadian corporation. Terms of the sale were not disclosed.

computer show the Macintosh™

Here are some of the companies who will be showing Macintosh products:

Advanced Logic Systems
Aegis Development
Ann Arbor Softworks
A+/Ziff-Davis Publishing Co.
Apple Computer, Inc.
Applied Logic Systems
Apropos Software, Inc.
Artline Industries
Assimilation, Inc.
Blue Chip Software
Boston Software
Brain Power, Inc.
Cadmus Computer Systems
The Cobb Group
Communications Packaging Corp.
Computer Additions
Computer Identics
Computer Learning Systems
Computer Shopper
Computer Software Designs, Inc.
The Computer Store
Corvus Systems, Inc.
Consulair Corporation/
T/Maker
Creighton Development, Inc.
Diablo Valley Design
Diversions, Inc.
EDP Supply North
Enterset
Esoft Enterprises
Expertelligence
Express Computer Supplies
First Byte, Inc.
Forethought, Inc.
Frontrunner Computer Industries
Future Design Software
General Computer Company
Haba Systems
Hayden Book Company
Hayden Software

Hayes Microcomputer Products
Hippopotamus Software
Icon Publishing
ICON Review/Mindwork
Infosphere, Inc.
InfoWorld
Innovative Technologies/Communications
Intermatrix, Inc.
Intersol
Iomega Corp.
The Kette Group
I/O Video
Kraft Systems
Layered, Inc.
Living Videotext, Inc.
Loki Engineering, Inc.
Lotus Development Corp.
Mac Packs, Inc.
MacTutor
MACWORLD
Micro Design
Micro Marketworld
Miles Computing, Inc.
Microsoft
MPH Computer Products
Mycroft Labs, Inc.
New Line 7
Odesta Corporation
Optimum Computer Luggage
Organizational Software Corp.
Palantir Software
Paradise Systems, Inc.
PBI, Inc.
Peripheral Computers & Supplies
Peripheral Systems
Personal Computer Peripherals
Prometheus Products, Inc.
ProVUE Development Corp.
Queue, Inc.
Scott, Foresman & Co.
Servidyne Micro Systems, Inc.



Sierra Information Systems
Silicon Beach Software
Small Business Computers of New England
SoftTech Microsystems
SoftIdea
Software Arts, Inc.
SoftWeave
Softworks Limited
Stoneware
Sunol Systems
Systems Control
Tecmar, Inc.
Telos Software Products
Video 7
Warner Software

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**MACWORLD
EXPOSITION**
BOSTON



Hogan Systems, Inc. announced the organization of **Hogan Services Corp. (HSC)**, a company owned by Hogan and BEI Holdings Ltd., parent of Atlanta-based Bank Earnings International.

HSC will provide those institutions that have licensed Hogan Systems' products with a single source for the resources needed to install and use their products.

IBM mathematician **Benoit Mandelbrot**, who originated a major development in 20th century mathematics — the theory of the Fractal Geometry of Nature — was awarded the Barnard Medal for Meritorious Service to Science by Columbia University. The medal is awarded on the recommendation of the National Academy of Sciences.

Martin Marietta Data Systems has formed a new business unit, **Merit Software**, as the direct marketing arm of the company to establish a business-to-business distribution channel for selling applicable Martin Marietta personal computer software products directly to purchasers and decision makers.

The Society of Telecommunications Consultants' Vendor Advisory Council named its 1985-86 officers at the society's spring conference.

The new council officers are **Jolene Witt**, president; **Virginia Murphy**, executive vice-president; **Philip Kay**, vice-president treasurer; and **Jeanne Schultz**, chairwoman of the education committee.

Control Data Corp. and **Financial Information Systems** of Richardson, Texas, have announced plans for CDC to provide nationwide on-site hardware and software support for users of FIS System 2001.

3M Corp. and **Informer Computer Terminals, Inc.** have signed an agreement for 3M's equipment and service and support division to service Informer 200 series workstations.

Terms of the agreement were not available.

COMPUTER INDUSTRY

SHORTS from page 97

Fujitsu America, Inc.'s peripheral products division announced that System Industries has become a field service organization for the Fujitsu M304X line of band printers.

Tele-Terminals, Inc. announced that it changed its name to Ameridata Systems, Inc., effective May 15.

Ameridata is headquartered in Minneapolis and has sales and service offices in Minnesota, Wisconsin, Iowa, Utah, Arizona, and North and South Dakota.

Cognos Corp. announced the opening of its first wholly owned subsidiary in continental Europe with the creation of Cognos-France Sarl in Paris.

American Channels, Inc., a newly formed publishing and distribution company for high-value engineering software, has announced the signing of a North American exclusive license for three mechanical engineering products developed by the CAD Centre Ltd. of Cambridge, England.

Wang Laboratories, Inc. announced the formation of its Communications Marketing Division, a new business unit dedicated to the communications marketplace. The unit, under the direction of Jim Harrison, general manager, and Ron Smith, vice-president of business development, is the first division of Wang's Business Development Group, which was formed last fall, to concentrate on new business ventures. The primary mission of the unit is to coordinate Wang's sales activities with the

seven regional Bell companies, the 22 divested Bell operating companies and the major independent communications and interconnect companies.

Tektronix, Inc. has formed a new subsidiary called Triquint Semiconductor, Inc., following approval by the Tektronix board of directors. Triquint, sponsored by the Tektronix Development Co., will manufacture and market ultrahigh-speed gallium arsenide integrated circuits, according to Tom Long, Tektronix Development's president, and vice-president and general manager of Tektronix's Design Automation Group.

TSR, Inc. has signed a six-year facilities management agreement with American Express International Banking Corp. TSR will operate IBM computers at its Long Island, N.Y.,

data center for American Express International Banking. In addition, TSR plans to seek additional facilities management contracts from financial services industry firms.

QMS, Inc. announced that both the lawsuit filed by QMS against Office Automation Systems, Inc., George H. Douglas, a former QMS employee and formerly a consultant to QMS, and the related suit filed by Office Automation Systems against QMS and Merriwether Circuit Designs, Inc., have been terminated. James Busby, president of QMS, said, "We are satisfied with the terms of the judge's order in QMS's suit against Office Automation Systems, and we are pleased that the suit against QMS and Merriwether has been dismissed."

See SHORTS page 99

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FRA

CHIPS from page 77

ing as the June ratio of new semiconductor orders to shipments, or book-to-bill ratio, held at .72, identical to the ratio in May. Average monthly orders from April through June fell 4.1% from the period from March through May to \$506.6 million, and the figure for April through June was down 57.4% from the same period in 1984.

"The lackluster semiconductor orders picture is the result of continuing weak demand for the products manufactured by our end customers," Hinkelman said. "The situation may be stabilizing . . . [but] the signals remain mixed for the near term." Hinkelman predicted, however, that the industry's orders for 1985 will show a decline of less than 20% from 1984.

During the current industry downturn, some U.S. companies have charged that leading Japanese vendors are selling products below cost in the U.S. to gain market share for the future. If proven, the practice, known as dumping, would violate international trade regulations.

The SIA petition, filed June 14, requests that President Reagan adopt policies that would prevent dumping as well as equalize the U.S. and Japanese import market shares in each country by 1986. After that date, the SIA said the president should push for "a dramatic improvement in U.S. semiconductor sales in Japan commensurate with the demonstrated competitiveness of U.S. products in other world markets."

Semiconductor industry analyst A. A. LaFountain III, president of LaFountain Research in Bay Head, N.J., said Yeutter's decision to investigate the SIA charges was expected. He noted, however, that U.S. political pressure would have a minimal effect on opening Japanese markets.

"[The SIA] complaints are legitimate, but the complexity of the problem defies an easy remedy," LaFountain said. "You're running smack into Japanese cultural barriers — they're extremely chauvinistic about buying their own products."



"No, I wouldn't believe your boss laid you off until 11 o'clock to reduce inventory."

COMPUTER INDUSTRY

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Tymnet, Inc. has opened a network system support center, located in the Great Valley corporate center in Malvern, Pa. The new facility offers a centralized location to monitor the data communications operations of 19 of Tymnet's private network customers.

In addition to network supervision, the support center handles network management problems.

Xerox Corp. announced the formation of a computer science research facility. The Portland, Ore., facility is an extension of the System Concepts Laboratory within the Xerox Palo Alto Research Center (Perc) in California.

The facility, known as "Perc" See **SHORTS** page 102

EXPORT from page 77

goods with mass appeal; and assisting companies in developing their own international distribution processes.

In its first full year of operations, focusing mainly on European distribution, the company expects to ship between \$15 million and \$20 million worth of goods "if we have a good year," Woodworth said.

Although foreign markets offer great potential, many young companies are resistant to export, according to Meyers and Woodworth. "There are a lot of U.S. high-tech companies with international potential, but those companies are not set up to take advantage of that potential, or they are too busy with the U.S. market," Meyers said.

Woodworth said many U.S. companies fail to recognize the value of building an early international presence. "One of the things the Japanese have been so successful in is recognizing the value of market share," he said.

U.S. companies need to invest in market presence for the future, according to Woodworth. "If they take the position that the dollar is too strong right now and they can come back in a year or so, well, that philosophy is not shared by the Japanese, and it's not shared by the Germans or the Koreans."

One company that has finalized a distribution agreement is Canaan Computer Corp. of Trumbull, Conn. Canaan spokeswoman Sherree Parke said the company deals through remarketers.

WIN from page 77

neering, respectively.

In a prepared statement, Visual Technology President and Chief Executive Officer Clifford Zimmer said, "This is another significant step in our recovery program. It provides Visual with the ability to concentrate its management and other resources on its core businesses, particularly its recently announced [Digital Equipment Corp.] — compatible terminal product line." Zimmer was not available for further comment.

John Lee, chairman and chief executive officer of Lee Data, said, "Adding a supermicrocomputer division to Lee Data is an important diversification step for us that extends significantly the range of the markets we address."

CODE from page 77

"attributed the improvements to microcode." Microcode is the big bugaboo of independent software developers that sell into the IBM world because it implies that only IBM-developed software will be able to achieve peak performance in IBM hardware.

In his view, it will never be possible to implement microcoded software fully because it would be practically impossible to maintain and update. "When you talk about microcode, what you are really talking about, in a majority of cases, is additional instructions added to the instruction set, not whole-scale movement of software into microcode," Tavitian said. "That is not economically feasible. It would be prohibitive to maintain because software constantly changes."

Tavitian said his recent campaign against IBM was designed to ensure that users have adequate information to make a decision. He is confident that when they are fully informed, they will opt for products developed by independents. "Our belief is that whenever IBM makes any sort of hardware enhancement, . . . every [independent] in the business . . . will find a way to take advantage of it better than IBM does."

tage of it better than IBM does."

If Coca-Cola users could do it, why not PCjr users? Take note IBM, the consumer is aroused. There are a couple of hundred thousand orphaned users out there who are mad as heck and just won't take it any more.

The Coca-Cola Co. saw the light — or possibly the dollar signs — and decided that consumer bad will was too heavy a burden to bear into the next fiscal year.

If IBM is truly interested in the home arena at some point, as its investment in a videotex venture and more recent investment in MCI Communications Corp. would seem to indicate, then at some point it is going to have to deal with the ill will generated by the, ahem, halt in production of the PCjr.

There were close to 300,000 of the little peanuts sold when IBM, ahem, stopped production. And who knows how many of us out there have picked up, ahem, out-of-production models at bargain basement prices since then.

C'mon IBM. You sold the little devils with the promise of future attachments. So deliver. Bring out a "Jr. Classic," or there are going to be some 300,000 people out there that you'll never migrate to MVS/XA.

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COMPUTER INDUSTRY

SHORTS from page 99

Northwest," will employ about a dozen researchers, as well as supporting management and administrative personnel.

CIE Systems, Inc., a subsidiary of C. Itoh Electronics, Inc., has consolidated its two multiuser business computer systems divisions serving the markets for AT&T Unix and Pick Systems' Pick operating systems, respectively, into a single new operating division called the Computer Systems Division.

Also, **CIE Systems** changed the name of its division that markets the CIE System family of IBM-plug-compatible terminals, controllers and printers to the Plug Compatibles Division.

Hayes Microcomputer Products, Inc. and **General Datacomm Industries, Inc.** jointly announced that Hayes will voluntarily withdraw, with prejudice, its action against General Datacomm in U.S. District Court in Atlanta.

In its complaint, Hayes alleged that a General Datacomm advertisement had contained false statements comparing a General Datacomm modem with a Hayes

modem.

Dataproducts Corp. and **Exxon Enterprises Printing Systems**, a division of **Exxon Corp.**, announced an agreement on the formation of a joint venture to design, manufacture and market business computer printers using advanced ink-jet technology.

Spectravideo, Inc. has reached an agreement with its unsecured creditors for the restructuring of approximately \$2.4 million of Spectravideo's debt.

Rosscomp Corp. announced that it has discontinued the production of its 8-in. form factor tape drive, the Series 80, and has reduced its work force of 55 employees by 17 people. Rosscomp's 5¼-in. drives, currently produced for Rosscomp by its Japanese licensee, Nippon Columbia, will replace the 8-in. drives in all applications.

Attache Software Canada, Inc. and **IBM Canada Ltd.** announced the signing of an agreement that gives IBM Canada exclusive rights to market, distribute and promote a new Attache accounting software product. IBM Canada will market the

product throughout Canada.

Xerox Corp. has established **Optimem**, its optical disk drive operation, as a wholly owned subsidiary. It has also named **Peter Lloyd** president. The Optimem subsidiary most recently was a division of Shugart Corp.

Computer Sciences Corp. (CSC) and two French companies have agreed to form a joint venture company to cooperate in international data

communications. CSC's partners in the venture are **Transpac S.A.**, which operates the French public data network, and **France Cables et Radio S.A.**, a supplier of telecommunications equipment and services. Both companies are owned by the French government, and together they will own a majority share of the new venture.

Digital Equipment Corp. and **Trammell Crow Co.** opened DEC's fifth data pro-

tection service center. The center, in Irving, Texas, stores magnetic tapes, disks, microfiche and paper and serves the Dallas/Fort Worth area. DEC also announced plans for opening data protection centers in Atlanta and Parsippany, N.J.

Telsat Corp. of Houston changed its name to more accurately reflect the company's products and services. The new name is **Microwave Networks, Inc.**

Psychological ploys of NCC booths

By Peter Bartolik
CW Staff

CHICAGO — IBM's booth at the National Computer Conference (NCC) here last week was practically guaranteed to turn off a "power buyer," but that was okay because the company's goal was to educate as many people as possible about IBM products.

But down the alley at the AT&T Information Systems booth, the goal was to identify as many "hot prospects" as possible, so quick interaction between showgoers and company representatives was deemed vital to weeding out the serious from the casual.

Those NCC observations were delivered by Allen Konopacki, an industrial psychologist and president of Chicago-based Incomm International. As psychologist to the stars at computer conferences, Konopacki's company counsels vendors' sales forces on the dynamics of trade show selling.

Among NCC exhibitors using Konopacki's tactics last week were AT&T, Hewlett-Packard Co., ITT, Honeywell, Inc. and Motorola, Inc.

IBM wants to educate, not sell

IBM was an Incomm customer, but according to Konopacki, the largest computer company did not require his services at this show. "IBM's real job here is to educate, not sell, sell, sell," Konopacki said during a floor tour with *Computerworld*. In fact, he said, when 90% of an audience turns away after the conclusion of a structured IBM presentation, the power buyer is likely to think most were disappointed. If the potential customer still is interested, he is likely to find himself competing for the IBM representative's attention with "the techie who wants to take off the back cover."

For those companies seeking to identify future sales prospects, rather than to educate the mass of "tire kickers," subliminal missteps can range from a slouching salesman to the wrong choice of carpet color.

Showgoers may not have realized it, Konopacki said, but the blue carpet lining the alleyways between booths was a psychological message to step into a booth.

But even blue carpet underfoot may have been preferable to stepping onto a light tan carpet if your mother nagged you about tracking in dirt, Konopacki said.

There were "invisible lines of demarcation" throughout the exhibit floors, but some vendors were using those lines to encourage potential buyers, while others were unwittingly using them to turn customers away, Konopacki said.

The high barrier surrounding much of Eastman Kodak Co.'s booth was an "innovative and gutsy" way of encouraging serious buyers and discouraging tire kickers, Konopacki said. But just down the way, a series of flashing lights bordering a light carpet intimidated most passersby and keep them passing by, he said.

A vendor representative filling out a visitor evaluation form could quickly determine who would merit further attention. But another

representative eagerly trying to hand out emblazoned pens was telling prospects, "I'm here to hand out pens," Konopacki said.

A simple company logo served its purpose and told showgoers the company is present, but the cluttered copy adorning some signs would never be read by most people, he said. "Typically a person spends less than 10 seconds reading a sign."

Despite all the subtle and not-so-subtle signals that exhibits gave off, most decision making at trade shows was based on the interaction between attendee and vendor representative, Konopacki said. His counseling often runs into resistance from salesmen because he tells them to drop traditional hard-sell techniques, he said. Rigid eye contact will turn off most people, and an aggressive approach will kill any prospects, he said.

An ironclad rule to salesmen is "shut up and listen," Konopacki said. "The thousands of dollars a company spends on equipment here is irrelevant; it's what the attendee wants to tell them that is important."

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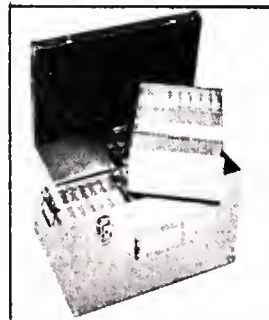
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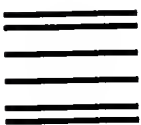
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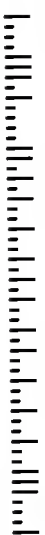
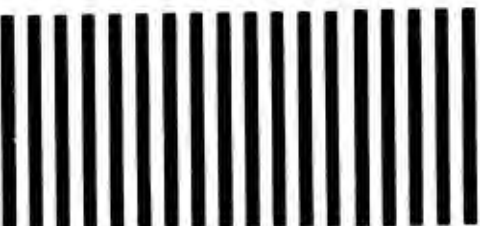
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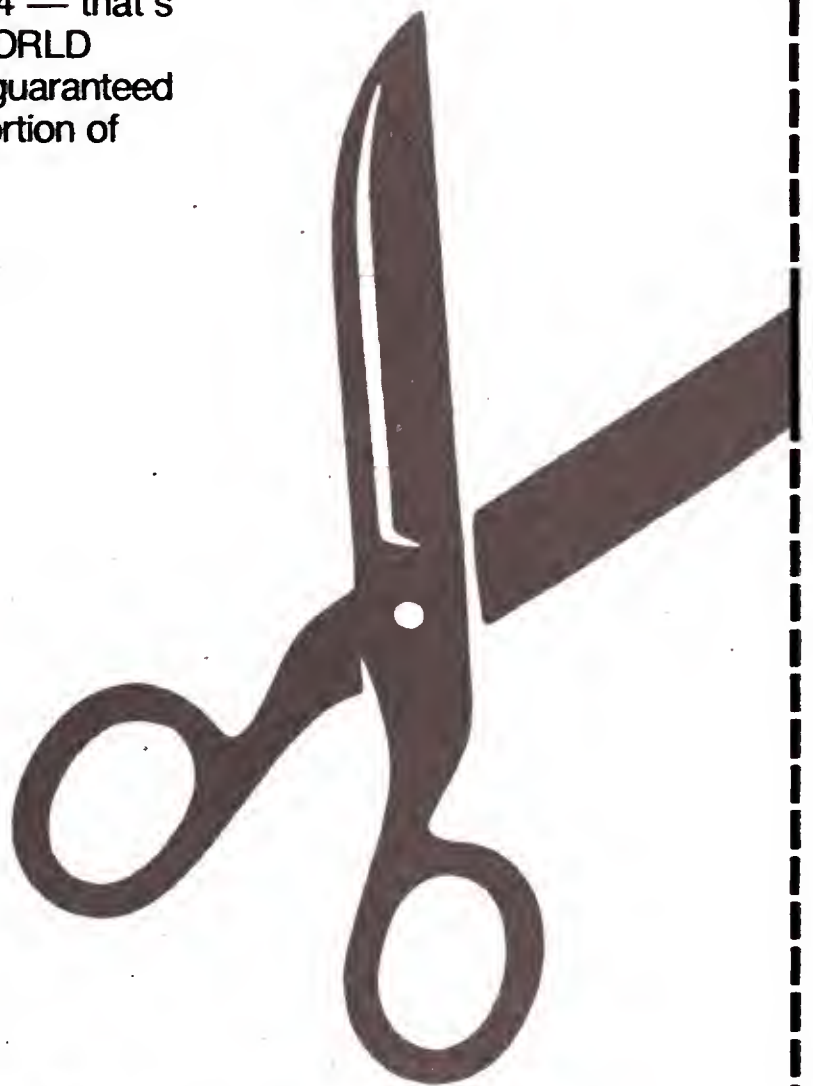
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COMPUTER INDUSTRY



Hadco Corp. announced revenue for the second quarter ended April 27 of \$24.7 million, compared with \$34.8 million during the year-earlier period. This resulted in a net loss of \$1.2 million, or 13 cents per share, compared with a net income of \$2.3 million, or 20 cents per share, in the comparable period one year earlier.

Gandalf Technologies, Inc. reported third-quarter revenue of \$21.4 million, up 23% from \$17.4 million from the year-earlier quarter. Profits were \$186,000, or 2 cents per share, compared with \$1.4 million, or

14 cents per share, in the year-earlier quarter.

Point 4 Data Corp. announced revenue in excess of \$19 million for the fiscal year ending March 31, 1985. "This represents a 27% increase over last year," said Bill Rigby, president and chief executive officer.

Intelligent Systems Corp. reported revenue for the fiscal year ended March 31 of \$123.9 million. Profits were \$1.8 million, or 16 cents per share, compared with \$9 million, or 84 cents per share, in the year-earlier period.

General Automation, Inc. announced revenue for the quarter just ended of \$13.6 million, compared with \$19.1 million in the prior year.

A net loss of \$4.5 million, or \$1.69 per share, was reported, compared with a net loss of \$1.4 million, or 51 cents per share, for the comparable period last year.

Applied Materials, Inc. announced profits for the second quarter of \$3.9 million, or 58 cents per share, compared with \$3.1 million, or 48 cents per share, for the same quarter last year. Revenue totaled \$49.5 million, compared with \$39.2 million in the corresponding period one year earlier.

Banctec, Inc. reported revenue for the fourth quarter ended March 31 of \$16.2 million, up 69% from \$9.6 million for the same period last year. Profits were \$345,000, or 8 cents per share, compared with a net loss of \$3.5 million, or \$1.05 per share, in

the year-earlier period.

Volt Information Sciences, Inc. announced profits for the second quarter ended May 3 of \$716,000, or 10 cents per share, compared with \$3.2 million, or 42 cents per share, in the comparable period last year. Revenue was \$100.7 million, compared with \$99 million in the same quarter one year earlier.

Advanced Systems, Inc. announced that revenue for the second quarter was up 24% from 1984 to \$11.5 million, and profits were \$2.2 million, or 22 cents per share.

Micron Technology, Inc. reported revenue for the third quarter ended May 29 of \$14.4 million, compared with \$29.4 million in the prior year. The firm posted a net loss of \$11.6 million; or 30 cents per share, compared with profits of \$13.1 million, or 29 cents per share, in the comparable period one year earlier.

C3, Inc. announced revenue for the fourth quarter ended March 31 of \$18.8 million, compared with \$15.1 million last year. The company reported a net loss of \$2.6 million, or 27 cents per share, compared with a net loss of \$438,000, or 5 cents per share, for the fourth quarter last year.

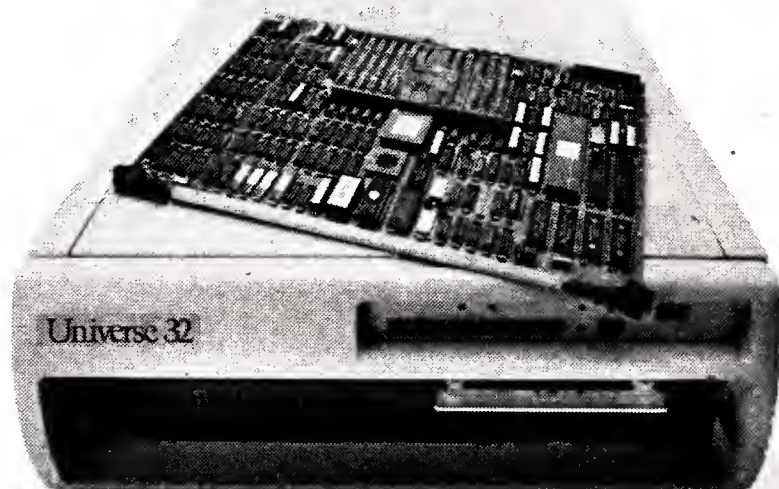
Pansophic Systems, Inc. reported revenue for its fourth quarter ended April 30 of \$18.1 million, compared with \$15 million in the same quarter one year ago. Profits were \$3.3 million, or 39 cents per share, compared with \$2.2 million, or 26 cents per share, in the same quarter last year.

Gandalf Technologies, Inc. reported third-quarter revenue of \$21.4 million, up 23% from \$17.4 million from the year-earlier quarter. Profits were \$186,000, or 2 cents per share, compared with \$1.4 million, or 14 cents per share, in the year-earlier quarter.

General Automation, Inc. announced revenue for the third quarter of \$13.6 million, compared with \$19.1 million in the same quarter last year. The firm reported a net loss of \$4.5 million, or \$1.69 per share, compared with a net loss of \$1.4 million, or 51 cents per share, in the same period one year earlier.

Hadco Corp. announced revenue for the second quarter ended April 27 of \$24.7 million, compared with \$34.8 million during the year-earlier period. This resulted in a net loss of \$1.2 million, or 13 cents per share, compared with a net income of \$2.3 million, or 20 cents per share, in the comparable period one year earlier.

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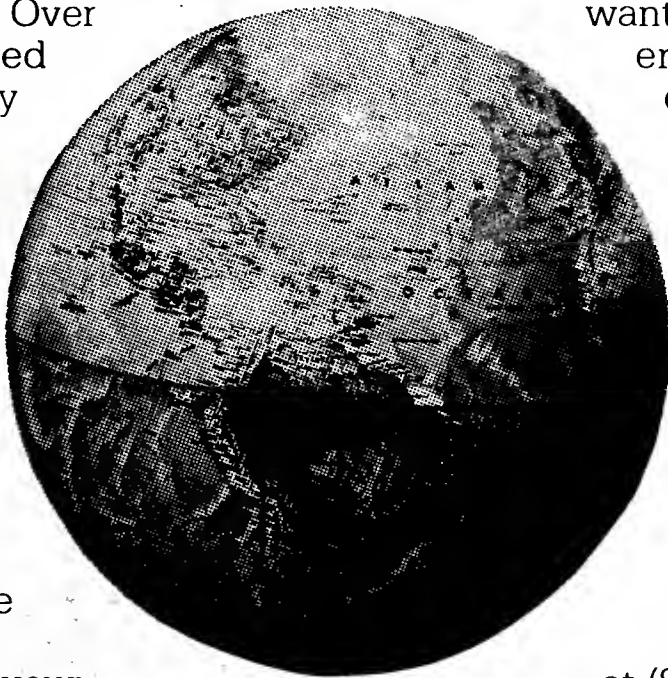
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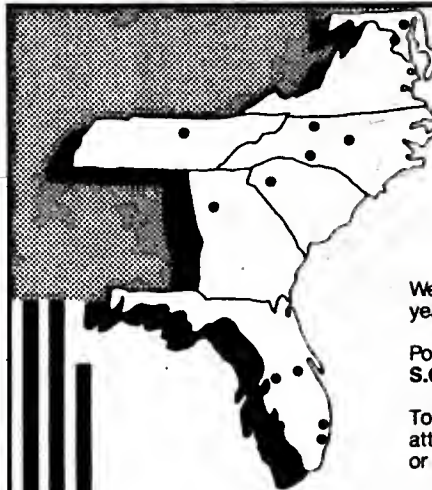
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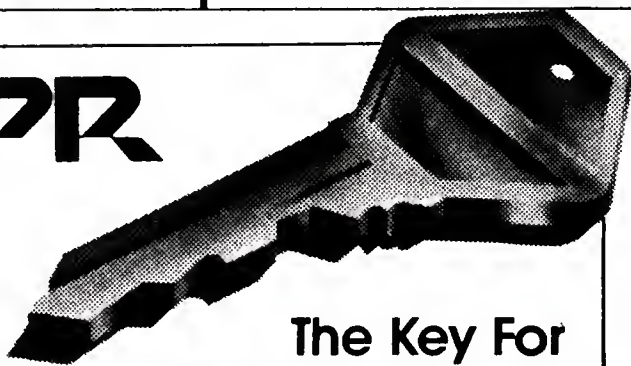
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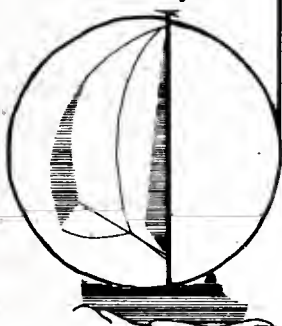
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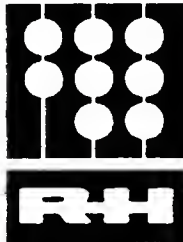
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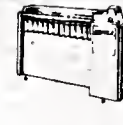
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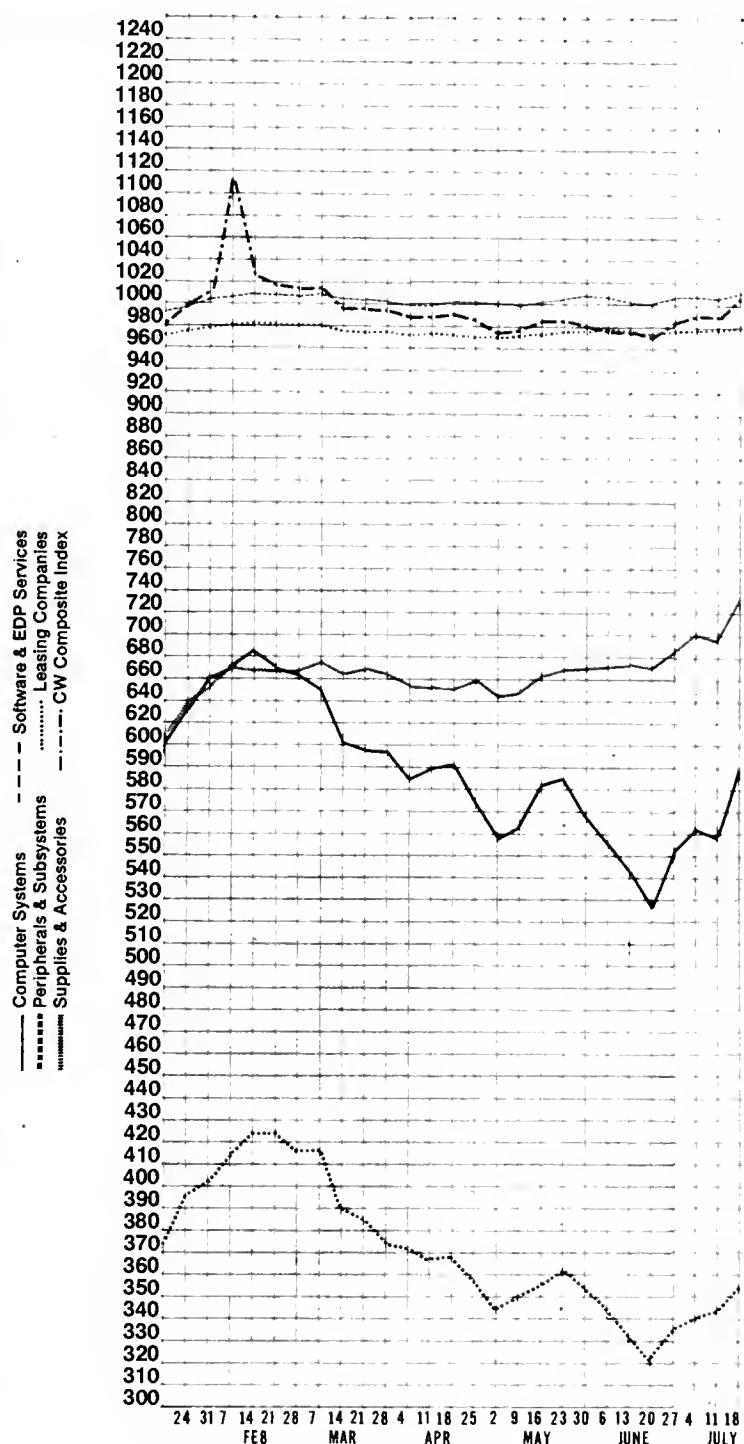
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Computerworld Stock Trading Index



Computerworld Stock Trading Summary

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computed and formatted
by
TRADE QUOTES INC
Cambridge, Mass. 02139

CLOSING PRICES WEDNESDAY, JULY 17, 1985

TRADE QUOTES
1985 CLOSE WEEK WEEK
RANGE JUL 17 NET CHNGE CHNGE
(1) 1985

COMPUTER SYSTEMS					
O ALPNA MICROSYSTEMS	6-24	5 3/4	-1/4	-4.1	
O ALTOS COMPUTER SVST	7-21	11 1/2	+1	+9.5	
O AMOHL CORP	10-18	14 1/4	+1 5/8	+12.8	
O APPLE COMPUTER INC	16-63	17 5/8	0	0.0	
O ATAT	15-24	22 3/4	-5/8	-2.6	
N BARRON CORP	48-66	81 1/8	+3 5/8	+8.3	
O COMPAQ COMPUTER CP	4-15	8 1/2	+1/8	+1.3	
O COMPUTER AUTOMATION	3-17	6 3/8	+1/2	+8.5	
O COMPUTER CONSOLES	5-20	6 1/8	+1 1/8	+22.5	
N CONTROL DATA CORP	25-35	28 1/4	+2	+7.6	
O CONVERGENT TECHNOL	35-41	7 1/4	-1/2	-7.8	
O CPT CORP	5-12	6	-3/8	-5.8	
N CRAY RESEARCH INC	38-82	82	+7 3/4	+9.1	
O DAISS SYSTEMS CORP	14-36	28 3/4	+3 1/2	+13.8	
N DATA GENERAL CORP	33-74	38 1/8	+3 7/8	+10.8	
O DATAPoint CORP	12-28	13 1/4	+3/8	+2.8	
N DIGITAL EQUIPMENT	77-125	88 5/8	+7 3/4	+8.4	
A EECO INC	12-16	13 7/8	+1/4	+1.8	
N ELECTRONIC ASSOC.	3-7	4 3/8	0	0.0	
N FLOATING POINT SVST	13-33	33 1/8	+4 1/4	+14.7	
N FOXBORO	25-36	25 5/8	+1/8	+0.4	
N GULU INC	20-32	25 1/4	+1/8	+0.4	
N HARRIS CORP	23-35	28	+1	+3.5	
N HENLETT-PACKARD CO	31-44	37 5/8	+2 1/2	+7.1	
N HONEYWELL INC	48-68	84 3/4	+3 3/8	+5.4	
N IBM	89-137	128 3/8	+8 1/8	+8.7	
O IPL SYSTEMS INC	1-14	2 5/8	+1/4	+10.5	
N ITT CORP	21-42	31 3/4	+1	+3.2	
N I/A-CON INC	13-24	21 5/8	+1 1/8	+5.4	
N MANAGEMENT ABIST	2-28	12 1/4	-1/8	-5.2	
N MATSUNITA ELEC (AOR)	52-81	58 3/8	+3/8	+0.8	
N MODULAR COMPUTER SVS	8-10	8 7/8	+1/8	+1.8	
N MONARK DATA SCI	2-17	2 3/4	+1/4	+10.0	
N MOTOROLA INC	28-44	33 5/8	+2 3/8	+8.3	
N NAT'L SEMICONDUCTOR	10-17	13 5/8	+1 3/8	+11.2	
N NBI INC	13-24	18 7/8	+1 7/8	+10.4	
N NCA	21-34	33 1/2	+2 1/4	+7.1	
N PEAKIN-ELNER	18-30	28 7/8	+1 7/8	+7.5	
N PRIME COMPUTER INC	11-20	20 1/8	+2	+11.0	
N SPERRY CORP	35-57	51 1/2	0	0.0	
O STANTIS COMPUTER INC	5-17	15 3/4	+2	+14.5	
O TANDON COMPUTERS INC	15-40	17 1/2	+3/4	+4.4	
N TANDY CORP	24-37	31 3/4	+1 1/4	+4.0	
O TELEVIDEO SYSTEMS	2-41	2 1/2	-1/8	-4.7	
O TELXON CORP	8-21	16 1/4	0	0.0	
N TEXAS INSTRUMENTS	98-150	88 7/8	+2 1/2	+2.5	
A ULTIMATE CORP	10-24	12 1/4	+5/8	+5.3	
O VECTOR GRAPHICS INC	0-8	1/4	-	-8.2	
A VAND LABS "B"	15-32	18 3/8	+3/8	+2.0	
A VAND LABS "C"	18-32	18 1/2	+3/4	+4.2	
N XEROX CORP	35-55	54 5/8	+1 1/4	+2.3	

LEASING COMPANIES

N COMDISCO INC	8-17	18 1/8	+1 5/8	+11.2
O CONTINENTAL INFO SVS	5-18	11 3/8	+5/8	+1.1
O FINACLO GROUP INC	4-12	4 1/4	+1/8	+3.0
O PHOENIX AMERICAN INC	2-17	2 5/8	-3/8	-12.5
O SELECTEAM INC	8-21	8 1/2	0	0.0
N U.S. LEASING	28-44	38 3/4	+2 1/4	+8.1

COMPONENTS

N ADVANCED MICRO DEV	23-41	28	+4 1/8	+18.5
N ADV'D SEMICONDUCTOR	10-38	11 3/4	+1 3/8	+13.2
N ANALOG DEVICES INC	18-25	22 7/8	+2 3/8	+11.5
O ANALOGIC CORP	10-31	14	+1 7/8	+15.4
N APPLIED MAGNETICS CP	8-21	14 1/8	+3/8	+2.7
O NADCO CORP	4-12	4	0	0.0
O MICRO MASK INC	8-15	7 1/4	+1/4	+3.5
N TERADYNE	20-35	23 3/8	+1 5/8	+7.4

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L=NATIONAL; N=MINNEAPOLIS; O=OVER-THE-COUNTER
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1985 CLOSE WEEK WEEK
RANGE JUL 17 NET CHNGE CHNGE
(1) 1985

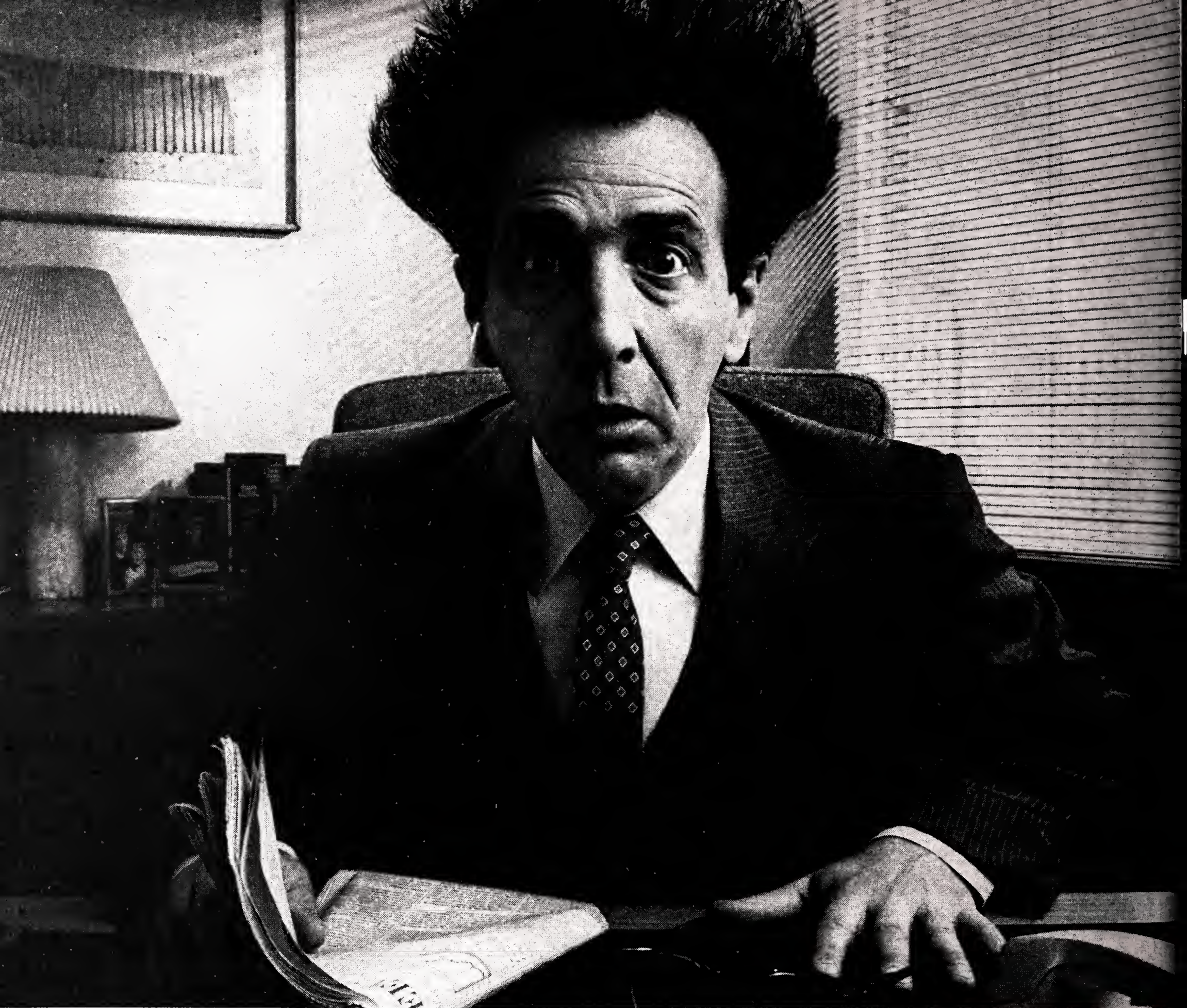
SOFTWARE & EDP SERVICES					
N ADVANCED COMP TECH	2-8	3 1/2	0	0.0	
N ADVANCED SYSTEMS INC	5-22	11 7/8	+3/8	+3.2	
O ADB COMPUTERS INC	10-32	16 1/4	-1/4	-1.5	
O AMERICAN SOFTWARE	8-20	13	-3/8	-2.8	
N ANACOMP INC	1-5	3	+1/4	+8.0	
O ANALYSTS INTL CORP	5-17	10 1/4	0	0.0	
N APPLIED DATA RES	18-38	30 1/2	+1 5/8	+5.6	
O ASHTON TATE	6-15	10 1/2	+1/2	+5.0	
O ASK COMPUTER SYSTEMS	11-24	13 1/2	+1 3/4	+14.8	
B ASTADYNE COMP IND	1-7	2 7/8	-1/16	-2.1	
N AUTOMATIC DATA PROC	30-53	52 5/8	+3 1/8	+3.1	
O COMPUTER ASSOC INT'L	15-35	28 1/4	+1 1/4	+4.6	
C COMPUTER HORIZONS	8-20	10 3/8	+3/8	+3.7	
O COMPUTER NETWORK	5-11	7 1/8	0	0.0	
N COMPUTER SCIENCES	11-20	20	+1 5/8	+8.8	
O COMPUTER TASK GROUP	8-18	17 1/2	+1/2	+2.9	
O COMPUTER USAGE	1-7	1 1/4	+1/4	+25.0	
O COMPUTONE SYSTEMS	4-23	3 3/4	-1/2	-8.0	
O CONSERV CORP	1-18	3	-1/2	-14.2	
O CONSHARE	8-14	5 1/8	+1/4	+2.8	
N CULLINET SOFTWARE	12-35	27 1/8	+2 1/4	+9.0	
O CYCARE SYSTEMS INC	18-27	21 1/8	+1 1/8	+5.6	
O HODAN SYSTEM INC	4-27	4 1/4	+3/8	+9.6	
N GENERAL ELECTRIC CO	46-65	63 1/4	+2 1/2	+4.1	
N GEOMOTORS E (EDG)	18-43	42 3/4	+3 1/4	+8.2	
N GTE CORP	36-45	42 1/2	+2 3/8	+5.8	
N INFORMATION GENERAL	14-27	26 1/2	0	0.0	
O INFORMATION SCIENCE	2-17	1 7/8	+1/4	+15.3	
O INFOTRON SYSTEMS CP	15-43	18 1/2	+3/4	+4.2	
O KEANE ASSOCIATES	8-18	17 3/4	+1/4	+1.4	
A LOGICOM	18-38	37 1/2	+4	+11.8	
O LOTUS DEVELOPMENT CP	15-40	28 1/4	+1	+3.8	
O MCI COMMUNICATIONS	6-28	10 1/4	+1/8	+1.2	
O MICROTECH INC	5-33	15	+1 1/8	+8.1	
O NATNENATIONAL APP GRP	3-18	3 1/4	+3/4	+30.0	
O NIDON SYSTEMS INC	15-30	18 3/4	+2	+11.2	
O MICROPRO INT'L CP	2-10	2	-1/8	-5.8	
O NATIONAL DATA CORP	8-28	13 1/2	+3/4	+5.8	
O ON-LINE SOFTWARE INT	4-28	7	-1/4	-3.4	
O PANGOPHIC SYSTEMS	11-30	24 1/8	+2 1/8	+9.6	
N PLANNING RESEARCH	10-15	14 3/4	+1/4	+1.7	
O POLICY MONT SVST CP	20-35	20 1/4	+1/4	+1.2	
O PROGRAMMING & SVS	4-8	6 1/8	+5/8	+11.3	
O REYNOLDS & REYNOLDS	28-53	41 3/4	-1/2	-1.1	
O SET CORP	11-34	18 1/2	+1/2	+2.7	
O SHARED MEDICAL SVST	23-43	30 3/4	+3 3/4	+13.8	
O SCIENTIFIC COMPUTERS	5-14	8 1/4	+1/4	+4.1	
O SOFTWARE AD	8-21	16	+3/4	+4.8	
N UAB CORP	10-14	12	+7/8	+7.8	
N UCCEL	7-17	16 1/4	+1 1/4	+8.3	

PERIPHERALS & SUBSYSTEMS

P AM INTERNATIONAL	2-7	3 7/8	+1/8	+3.3
A ANDERSON JACOBSON	3-11	3 1/8	0	0.0
O AST RESEARCH INC	7-20	17 1/8	+1 1/2	+8.5
O AUTO-TROL TECHNOLOGY	7-29	7	+1/2	+7.6
O AVANT-GARDE COMPUTING	7-29	9	+3/4	+9.0
O BANCYTE INC	5-22	8 1/4	-1/8	-1.3
A BEEHIVE INT'L	1-4	3/8	-1/8	-25.0
N BOLT-BERANEK & NEW	17-30	27 1/4	+7/8	+3.3
O CAMDEX CORP	1-3	5/8	0	0.0
N CENTRONICS DATA COMP	3-14	3	0	0.0
A CETEC CORP	6-12	6 3/8	+1/4	+4.0
A COONITRONICS	4-8	5 1/8	-1/8	-2.3

SUPPLIES & ACCESSORIES

N AMERICAN BUS PRODS	17-28	28 1/8	+3 1/8	+12.5
N BARRY WRIGHT	18-33	19 1/2	+1	+5.4
A DUPLEX PRODUCTS INC	11-15	15 1/4	+1 3/8	+8.0
N ENNIS BUS FORMS	18-40	36	-1/8	-0.3
N 3M COMPANY	68-86	80 1/2	+2 1/4	+2.8
N MOORE CORP LTD	18-53	21 5/8	+1	+4.8
O STANDARD REGISTER	14-37	36 3/4	+1 3/4	+5.0
N WALLACE CORP SERVICE	23-40	39 5/8	+2 5/8	+7.0



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